



# A DESCRIPTIVE CATALOGUE

of the Sanskrit Astronomical Manuscripts  
Preserved at the Maharaja Man Singh II Museum  
in Jaipur, India

**Compiled by**

**David Pingree** from the Notes Taken by Setsuro Ikeyama, Christopher Minkowski,  
David Pingree, Kim Plofker, Sreeramula Rajeswara Sarma, Gary Tubb





































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## PREFACE

In the mid 1990s the Seminar on Science of the Dharam Hinduja Indic Research Center at Columbia University undertook as its research project an investigation of the astronomical activities initiated and carried out by Sawāi Jayasimha, the Mahārāja of Amber and later of Jayapura in Rajasthan between 1700 and 1743. We chose this project both because there is a vast amount of unpublished manuscript material, in Sanskrit, Arabic, Persian, and Latin, relevant to the Mahārāja's activities, some of which we already had access to through photocopies, but most of which we knew still to be preserved in Jayapura itself, and because the efforts of Jayasimha to assimilate to Indian usage first Muslim and then European astronomy and the resistance he encountered promised to serve as a model case for approaching the far more complex process by which European science gained its dominant position in India in the nineteenth century.

With the financial support of the Dharam Hinduja Indic Research Center, we were able to spend the month of January in 1998 in Jayapura cataloguing the Sanskrit astronomical manuscripts in the Maharaja Man Singh II Museum. Our team consisted of six scholars: S. Ikeyama of Brown University, C. Minkowski of Cornell University, D. Pingree of Brown University, K. Plofker of Brown University, S. R. Sharma of Aligarh Muslim University, and G. Tubb of Columbia University. Each of us spent between one and four weeks working in the library of the Museum, describing the manuscripts and recording the information needed to identify the texts accurately and to determine the origins and histories of the manuscripts. The descriptions were placed in the hands of the present writer, who has compiled from them the present catalogue. We also were able to photocopy those manuscripts which seemed most important for the completion of the "Jaipur Project" as well as others whose texts were particularly rare or unusual. The original photocopies are with Prof. Pingree at Brown University.

In the course of this work we were assisted by many people, whom we are pleased to thank here. First we must express our profound gratitude to the present Mahārāja of Jayapura, Sawāi Bhawani Singh, for graciously allowing us to examine the manuscripts. We are also very grateful to Dr. Yaduvendra Sahai, the director of the Museum, whose kindness and hospitality increased immensely the pleasantness and profitability of our stay in Jayapura. We are also most appreciative of the patience and helpfulness of the library staff.

The staff of the Dharam Hinduja Indic Research Center at Columbia University also deserves our abundant thanks, especially the former director, Mary McGee, and the secretary, Nancy Braxton. They spared no efforts to ensure that we arrived safely in Jayapura, enjoyed pleasant accommodations, and had free and easy access to the manuscripts. All of us deeply regret the decision of the Hinduja Foundation to withdraw its support from the Center, which was thriving under the guidance of these two remarkable individuals.

Finally, we must also thank Virendra Nath Sharma of the Fox Valley Campus of the University of Wisconsin, who paved the way for our reception in



Jayapura and photographed the instruments at the Observatory there in the months preceding our visit. We hope that some way will be found to make these photographs available to interested scholars. And we owe a debt of gratitude to Setsuro Ikeyama, who patiently and accurately entered this complete catalogue into the computer.

David Pingree  
Providence, RI

#### Abbreviations

<i>ASS:</i>	<i>Ānandāśrama Sanskrit Series</i>
<i>CESS:</i>	D. Pingree, <i>Census of the Exact Sciences in Sanskrit</i> , Series A, vols. 1–6, Philadelphia 1970–
<i>CSS:</i>	<i>Chowkhamba Sanskrit Series</i>
<i>IJHS:</i>	<i>Indian Journal of the History of Science</i>
<i>IPTS:</i>	<i>Islamic Philosophy Theology and Science</i>
<i>KSS:</i>	<i>Kāśī Sanskrit Series</i>
<i>PAPS:</i>	<i>Proceedings of the American Philosophical Society</i>
<i>RORI:</i>	Rājasthān Oriental Research Institute (Jodhpur)
<i>RPG:</i>	<i>Rājasthāna Purātana Granthamālā</i>
<i>SATE:</i>	D. Pingree, <i>Sanskrit Astronomical Tables in England</i> , Madras 1973
<i>SATIUS:</i>	D. Pingree, <i>Sanskrit Astronomical Tables in the United States</i> , Philadelphia 1968
<i>SBG:</i>	<i>Sarasvatī Bhavana Granthamālā</i>

## INTRODUCTION

The manuscripts belonging to the library of the Maharaja Sawai Man Singh II Museum at Jayapura are divided into four separate collections: the Khāsmohor ("personal seal") collection, which was originally the personal library of the Mahārājas; the Puṇḍarīka, which was the collection belonging to the Puṇḍarīka or Paṇḍarīka family descended from Ratnākara Paṇḍarīka, who was the officiating guru at many of the performances of Vedic sacrifices patronized by Jayasiṃha; the Pothikhānā, which consists of manuscripts copied by the Pothikhānā staff; and the Museum collection, many of the manuscripts of which are on display in the Museum. Except for the Puṇḍarīka collection, these manuscripts were collected by various of the Mahārājas, first at Amber from the reign of Bhāramalla (1547 to 1573) till Jayasiṃha's foundation of Jayapura in 1727,<sup>1</sup> and thereafter at Jayapura itself until the reign of Sawāi Mānasiṃha II (1922 to 1970).<sup>2</sup>

I. The Khāsmohor collection contains at present manuscripts identified by a sequence of nearly 8,000 numbers (many numbers cover several manuscripts); an index of titles and of authors (divided into Sanskrit and vernacular texts) was published in 1976 by the scholar who has done most to catalogue the Jaipur manuscripts, Gopal Narayan Bahura.<sup>3</sup> This has been of immense value to us as the Khāsmohor collection contains 205 manuscripts on astronomy (not counting the pañcāṅgaś or calendars, which we have not included in our catalogue). All but eleven of these lie between the library numbers 4951 and 5609, reflecting an attempt to group manuscripts by subject matter. The latest dated manuscript among these is 5122(b) (our catalogue 89), which was copied in 1788/9. This date falls during the reign of Sawāi Pratāpasīṃha (1778 to 1803), who was well known for his interest in the manuscript library that he had inherited and worked to increase.<sup>4</sup>

According to James Tod,<sup>5</sup> Pratāpasīṃha's son, Sawāi Jagatsīṃha (1803 to 1818), whom he describes as "the most dissolute of his race," was so devoted to his concubine Raskafur that: "In the height of his passion for this Islamite concubine, he formally installed her as queen of half his dominions, and actually conveyed to her in gift a moiety of the personality of the crown, even to the invaluable library of the illustrious Jai Singh, which was despoiled, and its treasures distributed amongst her base relations." Bahura<sup>6</sup> notes that the lady probably would not have appreciated manuscripts and would undoubtedly have preferred other objects to satisfy "her lust for wealth".

Inventories of the contents of the library were periodically made. They are now preserved in the Rajasthan State Archives at Bikaner. Unfortunately, these inventories have not as yet been investigated in order that the history of the fate of individual manuscripts in the library could be traced. The astronomical and astrological books listed in one such inventory have been published by Sharma,<sup>7</sup> who claims that they were in Jayasiṃha's personal library. I list here those among these which are astronomical; the ones followed by a number are included in our catalogue of the Khāsmohor collection (we omit those copied after 1743,



the year of Jayasimha's death). The numbers in parentheses following the titles refer to the number of copies.

<i>Āryabhaṭīya</i> , golādhyāya (1)	
<i>Āryasiddhānta</i> (1)	
<i>Bṛhaspatisiddhānta</i> (1)	
<i>Bhāsvatī</i> (3)	49 (1606/7); 50 (1699); 51 (1701); 52 (1706); 54
<i>Brahmatulyasāraṇī</i> (1)	100–103
<i>Candrasūryagrahaṇādhikāra</i> (1)	
<i>Grahalāghava</i> (6)	72 (1647); 73 (1653); 74 (1704); 75 (1705); 76 (1706); 77(1733); 78 (1741); 81–85
<i>Grahalāghavaṭīkā</i> (1)	76 (1706), 84
<i>Grahalāghavodāharaṇa</i> (1)	82, 86 (1667), 87 (1706), 88 (1710), 91, 92
<i>Karaṇakutūhala</i> (1)	55 (1572); 56 (1705); 57 (1711); 61–63
<i>Karaṇaprakāśikā</i> (1)	47 (1626/7)
<i>Mahādevīsāraṇī</i> (1)	108–110, 112
<i>Makaranda</i> (1)	113–114
<i>Makarandaviveka</i> (1)	116(?)
<i>Mitākṣarā ṭīkā</i> (1) (see <i>Vāsanābhāṣya</i> )	
<i>Nalikābandhanakarmapaddhati</i> (1)	244 (1706)
<i>Pātasāraṇī</i> (3)	121; cf. 122 (1705)
<i>Pitāmahasiddhānta</i> (1)	3
<i>Rājamṛgāṅka</i> (1)	46 (1618)
<i>Siddhāntakaustubha majastī</i> (1)	
<i>Siddhāntarahasyaṭīkā</i> (1) (see <i>Grahalāghavaṭīkā</i> )	
<i>Siddhāntasamhitāsāra</i> (1)	247
<i>Siddhāntasindhu Nityānandī</i> (2)	266; 267 (1727); 268; 269
<i>Siddhāntaśiromaṇi</i> (6)	22 (1652); 23 (1651); 24 (1657); 25 (1706); 26 (1709); 27 (1727); 28 (1733); 29–31
<i>Siddhāntaviveka</i> (1)	42; 43
<i>Śrīyantracintāmaṇi</i> (1)	238 (1706)
<i>Sudhāsāraṇī</i> (1)	124(?)
<i>Sundarasiddhānta</i> (1)	41 (1706)

<i>Surasiddhānta</i> (1)	(?)
<i>Sūryasiddhānta</i> (7)	6 (1579); 7 (1642); 8 (1705); 11 (1707); 12; 13; 16
<i>Sūryasiddhānta</i> with <i>ṭikā</i> (1)	9–10 (1706); 14; 15
<i>Sūryatulyavidhāna</i> (1)	71
<i>Tattvaviveka</i> (1) (see <i>Siddhāntaviveka</i> )	
<i>Tithicintāmaṇisāraṇī</i> (1)	123, 180
<i>Tithivinodasāraṇī</i> (1)	
<i>Tripraśnādhikāra</i> (1)	
<i>Vāsanābhāṣya</i> pātādhyāya (1)	26 (1709)
golādhyāya (1)	23 (1651); 25 (1706); 28 (1733); 31; 33
<i>Vāsanābhāṣyamitākṣarā</i> (1)	24 (1657); 26 (1709); 32
<i>Vāsanāyantrādhyāya</i> (1)	25 (1706)
<i>Vyāsaiddhānta</i> (1)	37
<i>Yantrarāja</i> (5)	229 (1596); 230 (1617); 231 (1617); 232 (1706); 233 (1706)
<i>Yantrarājaṭīkā</i> (1)	229 (1596); 230 (1617); 231 (1617); 232 (1706); 233 (1706)
( <i>Zīj-i</i> ) <i>Muḥammad Shāhī</i> in <i>Nāgarī</i> (1)	

Just six manuscripts from the above list are definitely not now in the Khāsmohor collection; but the list does not include many manuscripts that we know were in Jayasimha's library, some of which still are at Jayapura. The manuscripts definitely in that library include those that he had copied by Tulārāma and Nātha when he first began to study astronomy in about 1706.<sup>8</sup>

9. *Sūryasiddhānta* with *bhāṣya* of Caṇḍeśvara. Nātha. 6 Nov. 1706.
10. Idem with idem. Nātha. 30 Nov. 1706.
11. *Sūryasiddhānta*. Tulārāma. 1 March 1707.
21. *Sauravāsanā*. Nātha. 31 August 1706.
26. *Siddhāntaśiromaṇi* with *Vāsanābhāṣya*. Tulārāma. 8 Sept. 1709.
41. *Sundarasiddhānta*. Tulārāma. 5 Nov. 1706.
52. *Bhāsvatī*. Tulārāma. 8 Dec. 1706.
76. *Grahalāghava* with *ṭikā*. Tulārāma. 5 Sept. 1706.
87. *Grahalāghavodāharana*. Tulārāma. 11 Oct.–26 Oct. 1706.
118. *Makarandodāhṛti*. Tulārāma. 8 Dec. 1706.
232. *Yantrarājāgama* with *vyākhyā*. Tulārāma. 23 Sept. 1706.



233. Idem. *Tulārāma*. 16 Nov. 1706.  
 238. *Yantracintāmaṇi*. *Tulārāma*. 14 Nov. 1706.  
 244. *Nalikābandhakarmapaddhati*. *Tulārāma*. 17 Sept. 1706.

One further manuscript from this group has gone astray. This is a copy of Kamalākara's *Śeṣavāsana*. 42ff. Copied by *Tulārāma* at the command of Mahārājādhirāja Jayasiṃha on 1 kṛṣṇapakṣa of Kārttika in Sam. 1765 = ca. 18 September 1708. This is now 417 of 1884/86 at the Bhandarkar Oriental Research Institute, Pune. Of these 15 manuscripts only the *Śeṣavāsana* and the *Sauravāsana* seem not to be included in the inventory.

Another group that we know Jayasiṃha had were manuscripts based on Islamic astronomy that he acquired in the late 1720s; they include copies of translations from Arabic and Persian that are uniformly bound.<sup>9</sup>

253. *Ukara*. (Lakṣmīdhara). 23 October 1729; acquired 1730.  
 255. *Jarakāliyantra*.  
 257. *Yantrarājasya rasāla*. Kṛpārāma. ca. 1729.  
 259. *Śarahatajkirā Virjandī*. Kṛpārāma; acquired 1730.  
 260. *Vakramārgavicāra*. Lakṣmīdhara.  
 262. Lunar tables of the *Ullakabegījica*.  
 265. *Hayatagrantha*. (Tikārāma). 1728/9.  
 267. *Siddhāntasindhu*. Gaṅgārāma. 1727.  
 270. *Yantraprakāra*.

We also know that Jayasiṃha had a copy of Nityānanda's *Sarvasiddhāntarāja*, since he quotes from it.<sup>10</sup> Of these texts only the name of the *Siddhāntasindhu* is found in the inventory.

Yet another group of manuscripts that should have been in Jayasiṃha's library are those of works that he himself or his associates wrote. Jayasiṃha's works on astronomy are the *Sūryasiddhāntasāravicāra* of ca. 1715/20 (manuscript 44), the *Yantrarājaracanā* of ca. 1720 (not in the Khāsmohor collection, but there is a copy, manuscript 240, in the Puṇḍarīka collection, and a copy was made at the court in Jayapura and presented to David Eugene Smith at Jayapura in 1907; it is now Smith Indic 73 at Columbia University), the *Yantraprakāra* of 1729 (manuscript 270, now in the Museum collection, was presumably once in the Khāsmohor; manuscript 271 is in the Puṇḍarīka collection), and the *Jayavinodasāriṇī* of 1735 (there are no manuscripts left at Jayapura, though pañcāṅgas following its method have been produced there up to the present day. One of the five extant manuscripts—11839 in the Rājasthan Oriental Research Institute in Jodhpur—was copied by Karuṇākara Pau(ṇḍarīka) on 28 September

1906<sup>11</sup>). Only two of Jayasimha's own four productions, then, are still in the Khāsmohor collection, and none are included in the inventory.

Jayasimha's Jyotiṣarāya, Kevalarāma, an astronomer from Modasa in Gujarāt who entered his service in 1725, wrote six works at the Mahārāja's command: the *Bhāgavatajyautiṣayor bhūgolakhagolavirodhaparihāra*, the *Brahmapakṣanirāsa*, the *Dr̥kpakṣasāraṇī* in about 1732, the *Vibhāgasāraṇī*, the *Jīvāchāyāsāraṇī*, and the *Pañcāṅgasāraṇī* in 1735. None of these works is represented in the Khāsmohor collection or included in the inventory, but there are two manuscripts—171 and 172—of the *Pañcāṅgasāraṇī* in the Puṇḍarīka collection.

Jayasimha's chief guru, Jagannātha Samrāt, translated Euclid's *Elements* and Ptolemy's *Almagest* from Arabic into Sanskrit. One manuscript containing both these translations is now number 32 of the Reserved Collection of the Museum collection; we were not allowed to examine it because of pending litigation. It presumably was once in the Khāsmohor collection, but is not included in the inventory. A second copy, perhaps of the Reserved Collection manuscript, is in the Pothikhānā collection (254). There were three versions of Jagannātha's *Siddhāntakaustubha*; the first, written in early 1727, is in the Puṇḍarīka collection (45);<sup>12</sup> the last, presented as a supplement to the translation of the *Almagest* in 1732, is apparently the *Siddhāntakaustubha majastī* of the inventory. At least part of Jagannātha's library was acquired by Viśveśvara Puṇḍarīka, whose floruit was toward the end of the eighteenth century. His acquisitions included manuscripts 36 (*Vṛddhavarasiṣṭhasiddhānta*, Copied 10 October 1690), 39 (*Somasiddhānta*, Copied 13 October 1723), and 123 (*Subodhinī*, Copied 15 November 1730), but apparently none of Jagannātha's own works.

It is quite surprising that so many of the treatises produced by these three men at Jayasimha's court are no longer in the Jayapura library, but it is even more astonishing that only one is included in an inventory that allegedly comes from Jayasimha's own time, and that that is a work written in 1732.

The last item in the inventory is (*Zīj-i*) *Muḥammad Shāhī*, allegedly in Nāgarī. There are several manuscripts at Jayapura with material from Ulugh Beg's *Zīj-i Jadīd*; these are manuscripts 261–264. Ulugh Beg's planetary tables and lunar tables (261 and 262) are in the Museum and Khāsmohor collections; the star catalogues, precessed to 1726, are in the Puṇḍarīka collection. Of course the precessed star-catalogue of Ulugh Beg was incorporated into the Persian *Zīj i Muḥammad Shāhī*, but it is doubtful that this is what the inventory refers to, especially as it is not in the Khāsmohor collection. A more likely candidate is a manuscript now in Berlin, or. fol. 2973 at the Städtbibliothek.<sup>13</sup> This contains computations of the longitudes and latitudes of the Moon and the planets and of the longitudes of the Sun at noon at Jayapura on 7 March 1718 according to the *Zīj i Muḥammad Shāhī* and computations according to the same authority of a lunar eclipse on 28 May 1732 and of a solar eclipse visible at Jayapura on 20 May 1734. This manuscript may well have once been in the Khāsmohor collection. I do not know how it got to Berlin.

The inventory, then, bears some relationship to the Jayapura library. If the reference to the *Zīj i Muḥammad Shāhī* is part of the original list, that list was



made after about 1735, otherwise after 1732. But it was clearly not a complete inventory, whenever it was compiled.

II. The Puṇḍarīka collection, which consists of about 2,300 manuscripts collected by Ratnākara Puṇḍarīka and his descendents between the early eighteenth and the late nineteenth century, was acquired by the Jayapura Pothikhānā under Sawāi Mādhavasimha II in 1905<sup>14</sup> and added to the existing library. We were fortunate to be given access to a handwritten, classified list, from which we identified fifty-seven manuscripts to include in this catalogue. Ratnākara belonged to a Mahārāṣṭrian family of the Śaundilyagotra, named Mahāśabde. His father, Devabhaṭṭa, who had been honored by Jayasimha's great-grandfather, Mahārāja Rāmasimha (1667 to 1689),<sup>15</sup> was a resident of Kāśī, where his son, Ratnākara, studied under the famous scholar Nāgeśa (Nāgojī) Bhaṭṭa. He was summoned by Jayasimha to Amber to be his guru shortly after his ascent of the *gaddi* of Amber on 25 January 1700; for Ratnākara at the conclusion of his *Jayasimhakalpadruma*, which he completed on ca. 21 August 1713, reports that he had already performed for Jayasimha the following Vedic sacrifices: *jyotiṣṭoma*, *vājapeya*, and *puṇḍarīka* (for which he received the title Paṇḍarīkayājīn).<sup>16</sup> It is known that he performed the *vājapeya* for Jayasimha on 31 December 1708.<sup>17</sup>

Nothing further is known about Ratnākara, who must have been quite elderly in 1713; he probably died about 1720. His son Sudhākara performed a *puṣa-medha* sacrifice for Jayasimha at some uncertain time.<sup>18</sup> Another son, Gaṅgārāma, who had participated in the *vājapeya* sacrifice in 1708,<sup>19</sup> and to whom Jayasimha paid his respects in 1733, died in 1755.<sup>20</sup>

The members of the family who are known to have acquired manuscripts on astronomy lived in the latter half of the eighteenth century. The most important was Viśveśvara, the son of Rāmeśvara<sup>21</sup>, the son of Gaṅgārāma, the son of Ratnākara, whose acquisition of at least three of Jagannātha's manuscripts has already been reported. The other manuscripts that he owned included 48 (*Karaṇaprakāśa*), 60 (*Karaṇakutūhala*. Copied by Gopīnātha, the son of Rāmeśvara Vyāsa, on 31 October 1788), 65 (*Brahmatulyodāharaṇa*), 90 (*Grahalāghavodāharaṇa*. Copied in 1788/9), 212 (*Chāḍikanirṇaya*), 236 (*Dhruvabhramayantra*. Copied by Gopīnātha, the son of Rāmeśvara Vyāsa, on 5 November 1789), 240 (*Yantrarājaracanā*), and 258 (*Yantrarājasya rasāla*. Copied for the Paṇḍarīkas on 28 November 1788). Viśveśvara Mahāśabda Puṇḍarīka also composed 243 (*Palabhāyantra*), probably in the 1790s; he was the author of the tables in manuscript 199 as well. Viśveśvara also wrote a *Nirṇayakautuka* and a *Pratāpārka* on dharmaśāstra for Mahārāja Pratāpasimha.

Another member of the Puṇḍarīka family, Gokula or Gokulanātha, the son of Śambhūnātha, copied 93 (*Grahalāghavodāharaṇa*), 171 and 172 (*Pañcāṅgasārāṇī*. Copied 3 April and 28 April 1793), and 189 (a *sāyanalagnasārīṇī*. Copied in November or December 1788). He also employed Gopīnātha—presumably the son of Rāmeśvara Vyāsa, who had worked for Viśveśvara—to copy 152 (*Grahalāghavasārīṇī*). Gopīnātha, the son of Rāmeśvara Vyāsa, also copied 234 (*Yantrarājagama*) for Jāgeśvara on 14 December 1788; it is not known whether or not Jāgeśvara was a Paṇḍarīka.

The last Paṇḍarīka whom we know to have contributed manuscripts on astronomy to the family collection was Dhaneśvara who owned 225 (a treatise on stars) and 228 (*Palabhājñāna*) and who employed Śyāmasundara to copy 80 (*Grahalāghava*) on 6 March 1826. It was probably the same scribe who copied the same text on 16 January 1826 (manuscript 79), and who seems to have been involved in 245 (on the gnomon).

Certain other manuscripts in the Puṇḍarīka collection clearly represent or are manuscripts that were once in the Khāsmohor collection. These are 48 (*Karaṇaprakāśa*. A copy of Khāsmohor 4953), 94 (*Grahalāghavavārttika*. A commentary that illustrates the astronomy of the *Grahalāghava* by computing according to it the longitudes of the planets at the time of Jayasimha's birth on 3 November 1688), 222–223 (*sūryapatras*), 234 (*Yantrarājāgama*. Copied from Khāsmohor 4958 by Gopīnātha on 14 December 1788), 246 (on gnomonics as practiced at Jayapura), and 256 (*Jarakālīyantra*).

III. The Pothikhānā collection, which was instituted by Jayasimha, comprises copies of manuscripts in the Khāsmohor collection, copies of other manuscripts and printed books, and manuscripts presented as gifts. There are about 2,200 manuscripts in this collection: catalogues have been published of its holdings on *dharmaśāstra*<sup>22</sup> and *stotras*.<sup>23</sup> We consulted a handwritten list of the jyotiṣa manuscripts, and found just five that fit the criteria for inclusion in this catalogue. Four of these were copied by the same scribe from printed books; these are 4 (*Āryabhaṭīya*), 5 (*Śiṣyadhīvrddhidatantra*. Copied by Līchamīnārāyaṇa at Surata on 10 July 1895), 17 (*Sūryasiddhānta*), and 35 (*Brahmasiddhānta*. Copied by Līchamīnārāyaṇa at Surata on 24 August 1895). The last manuscript is 254 (*Rekhāgaṇita* complete and *Samrāṭśiddhānta* incomplete), perhaps a copy of manuscript 32 of the Reserved Collection.

IV. The Museum collection presumably contains manuscripts extracted from the Khāsmohor collection as being especially rare and valuable, and suitable for public display in the Museum. A list of these manuscripts has been published;<sup>24</sup> we have included twelve in our catalogue. We did not have sufficient time to include the fourteen manuscripts of astronomical works in Arabic and Persian.<sup>25</sup> We hope to be able to remedy this failure on a later occasion.

In conclusion, we should comment on some of the most valuable manuscripts that we discovered in cataloguing this collection. We will discuss those in each category in its order in the catalogue.

#### B. Siddhāntas

3. The *Paitāmahasiddhānta* from the *Viṣṇudharmottarapurāṇa*. One of four copies of this work, fundamental to the Brahmapakṣa. David Pingree hopes to prepare a new edition.

44. The *Sūryasiddhāntasāravacāra* attributed to Jayasimha himself; there is only one other known copy. The Jayapura copy is important especially for its diagrams. An edition is being prepared by Gary Tubb.

45. The earliest version of Jagannātha's *Siddhāntakaustubha*, in which Jayasimha's bijas to the *Sūryasiddhānta* devised in 1726 and his parameters derived



from Nityānanda's *Sarvasiddhāntarāja* are recorded. David Pingree has prepared an edition of this.

#### C. Karaṇas

46. A full version of Bhojadeva's *Rājamṛgāṅka* radically different from the published version. David Pingree will publish this.

71. Dāmodara's *Sūryatulya*. Only three other copies are known.

#### D. Koṣṭhakas

118 The unique manuscript of Moreśvara's *Makarandaṭippaṇa*.

143. The unique manuscript of Harinātha's tithi, nakṣatra, and yoga tables.

147. The unique manuscript of Goparāja's *Kḥagatarāṅgiṇī*.

171 and 172. Two of the four known manuscripts of Kevalarāma's *Pañcāṅgasāriṇī*. An edition has been prepared by David Pingree.

#### E. Eclipses

216–220. Observations and computations of lunar eclipses on 18 May 1761, 17 April 1772, 23 March 1773, 30 September 1773, 15 February 1775, 5 February 1860, and 6 February 1860 (sic!).

#### F. Star Charts

221. The unique star chart of Mādhavasimha, made in about 1760.

222 and 223. Unique *sūryapatras*.

#### G. Geographical Tables

226 and 228. Two geographical tables supplementing those previously published.<sup>26</sup>

#### I. Miscellaneous

250–251. Two manuscripts of Nandarāma Miśra's *Bhāgavatajyotiḥśāstra-bhūgolakhagolavirodhaparihāra*, an expansion of Kevalarāma's similarly entitled treatise. Editions of both are being prepared by Christopher Minkowski and David Pingree.

#### J. Translations

259. The unique copy of the Sanskrit translation of II 11 of Naṣīr al-Dīn al-Tūsī's *Tadhkira* with al-Birjandī's commentary. An edition has been published by Takanori Kusuba and David Pingree.

263 and 264. Sanskrit versions of Ulugh Beg's star catalogue. These will be edited by David Pingree.

265. A rare manuscript of the Sanskrit translation of 'Alī al-Qūshjī's *Risālah dar hay'at*. An edition by David Pingree and Kim Plofker is in preparation.

266–269. Four of the six manuscript copies of Nityānanda's Sanskrit translation of Farīd al-Dīn Dihlawī's *Zīj i Shāhjahānī*.

271. The third known copy of Jayasimha's *Yantraprakāra*, which has been published from the other two by S. R. Sarma.

272. The manuscript copy of the second edition of Philippe de La Hire's *Tabulae Astronomicae*, published at Paris in 1727, completed by Joseph du Bois at Jayapura on 10 September 1732.

273 and 274. Two of the four manuscripts containing the prose Sanskrit translation of de La Hire's *Tabulae* and/or the *Phirāṅgicandracchedyopayogika*. Both texts will be published by David Pingree.

275. Attempts to illustrate de La Hire's third lunar equation.

276. Tables comparing Jayasimha's observed lunar positions with those computed by means of de La Hire's tables and the "New Tables."

The thorough investigation of these manuscripts will greatly expand our knowledge of the astronomical activities at Jayasimha's court, which constitute in many aspects a sort of rehearsal for the Indian reaction to Western astronomy in the nineteenth century.

### The Manuscript Descriptions

Each separate text is headed by a paragraph giving its title or titles, its author if known, the place of its composition if known, and its date if known. These data are followed by references to *CESS* (D. Pingree, *Census of the Exact Sciences in Sanskrit*, Series A, vols. 1–5, Memoirs of the American Philosophical Society, Philadelphia: American Philosophical Society, 1970–1994), *SATIUS* (D. Pingree, *Sanskrit Astronomical Tables in the United States*, Transactions of the American Philosophical Society 58,3, Philadelphia: American Philosophical Society, 1968), and *SATE* (D. Pingree, *Sanskrit Astronomical Tables in England*, Madras, Kuppuswami Sastri Research Institute, 1973), as appropriate, and a reference to the edition, if one exists, with which the manuscript has been compared. After this is given, whenever available, the work's incipit—usually a verse.

The description of the manuscripts of each work are arranged first in ascending order of the dates of copying for those that are dated, then in the ascending order of their identification numbers in the collection they belong to.

The description of each manuscript consists of its serial number, its shelf-mark, the numbers given by the scribe to its folios or, lacking those, an assignment of capital English letters to unnumbered folios, the dimensions of the manuscript leaves in centimeters to the nearest half-centimeter, height before width (the writing is always taken to be parallel to the width), and the number of lines per page. After this, as appropriate, are comments on the physical condition of the manuscript, the presence of marginalia, the part of the text included, and the presence of a commentary. Then, as available, is information about the scribe, his location, and the date on which he completed the copying of the manuscript. Finally, any information concerning owners of the manuscript is recorded.

If the manuscript is incomplete, the beginning and end of each portion of the text (but not the incipit if nothing is missing from the beginning of the text) is given with the page and line in the edition referred to on which the first and last words occur. Descriptions of *koṣṭhakas* generally give details concerning the structure, use, and parameters of each table.

Succeeding this is the colophon with a reference to the folio on which it occurs; the colophon is the statement of the author and the title of the text.



After this is the post-colophon, which gives information concerning the scribe, his patron, and the place and date of the copying. Ownership notes, if any, follow this. These excerpts from the manuscript are presented in the scribe's orthography.

Next are given copies of material extraneous to the main text that the original scribe or later persons have written in blank spaces in the manuscript—usually on the recto of the first leaf and/or the verso of the last. The final element is an indication of the price of the manuscript.

The volume ends with a concordance of library numbers and catalogue numbers of the manuscripts, a list of the dates on which manuscripts were copied, and indices of authors, titles, scribes and owners, other owners, families and other social units, toponyms, and subjects. The reference numbers are the catalogue numbers of the manuscripts.

David Pingree

## Notes

<sup>1</sup>Gopal Narayan Bahura, *Literary Heritage of the Rulers of Amber and Jaipur*, Jaipur 1976, first part, pp. 27–49.

<sup>2</sup>*Ibid.*, pp. 71–95.

<sup>3</sup>*Ibid.*, second part, pp. 3–130 (Sanskrit works), pp. 131–217 (bhāṣā works), and p. 218 (Arabic, Persian, and Urdu works); pp. 219–287 (Sanskrit authors), pp. 288–342 (bhāṣā authors), and pp. 343–500 (extracts from important manuscripts).

<sup>4</sup>*Ibid.*, first part, pp. 17–18 and 80–81.

<sup>5</sup>James Tod, *Annals and Antiquities of Rajasthan*, edited by William Crooke, 3 vols., London: Oxford University Press, 1920, vol. 3, pp. 1364–1365.

<sup>6</sup>Bahura, *op. cit.*, first part, p. 18.

<sup>7</sup>Virendra Nath Sharma, *Sawai Jai Singh and His Astronomy*. Delhi: Motilal Banarsidass, 1995, pp. 328–330.

<sup>8</sup>David Pingree, "An Astronomer's Progress," *Proceedings of the American Philosophical Society* 143, 1999, 73–85. I have reinterpreted the ambiguous wordings of the dates of manuscripts 9, 26, 41, 232, 233, 238, and 244 in an attempt to improve the data given on p. 74, fn. 7.

<sup>9</sup>D. Pingree, "Sanskrit Translations of Arabic and Persian Astronomical Texts at the Court of Jayasimha of Jayapura," *Suhayl* 1, 2000, 101–106.

<sup>10</sup>D. Pingree, "The Original Version of Jagannātha's *Siddhāntakaustubha*," forthcoming.

<sup>11</sup>The manuscripts and the tables of Jayasimha's *Jayavinodhasāriṇī* are described by D. Pingree, "Kevalarāma's *Pañcāṅgasāriṇī*," forthcoming.

<sup>12</sup>For these versions and their interrelation see the article cited in fn. 10.

<sup>13</sup>D. Pingree, "Indian Reception of Muslim Versions of Ptolemaic Astronomy," in F. Jamil and Sally P. Ragep, eds., *Tradition, Transmission, Transformation*, Leiden: E. J. Brill, 1996, 471–485 (484).

<sup>14</sup>Bahura, *op. cit.*, first part, pp. 21 and 89.

<sup>15</sup>*Ibid.*, first part, p. 44, and second part, p. 424.

<sup>16</sup>*Jayasimhakalpadruma*, edited by Harinārāyaṇa Śarma, Kalyāṇa-Mumbai, 1925, p. 912.

<sup>17</sup>Bahura, *Literary Heritage*, first part, p. 59, and second part, p. 423. This yajña is described by Viśvanātha Bhaṭṭa in his *Rāmavilāsakāvya* III 1–51, ed. G. N. Bahura, Jaipur: Maharaja Sawai Mansingh II Museum, 1978, pp. 46–53.

<sup>18</sup>V. S. Bhatnagar, *Life and Times of Sawai Jai Singh*, Delhi: Impex India, 1974, p. 344.

<sup>19</sup>Bahura, *op. cit.*, second part, p. 425.

<sup>20</sup>Bhatnagar, *op. cit.*, p. 332; see also K. V. Sarma "Brahmapuri, the Scholars' Village Established by Maharaja Sawai Jai Singh," *Indologica Jaipurensia* 2, 1988–1995, 45–53, esp. 48–49.

<sup>21</sup>On Rāmeśvara see Sarma, *op. cit.*, 49–50.

<sup>22</sup>G. N. Bahura, *Catalogue of Manuscripts in the Maharaja Sawai Man Singh II Museum (Pothikhana Collection; (a) Dharmaśāstra)*, Jaipur: Maharaja Sawai Man Singh II Museum, 1984.

<sup>23</sup>G. N. Bahura and R. G. Sharma, *Catalogue of Manuscripts in the Maharaja Sawai Man Singh II Museum (Pothikhana Collection; (b) Stotras)*, Jaipur: Maharaja Sawai Man Singh II Museum, 1987.

<sup>24</sup>G. N. Bahura, *Catalogue of Manuscripts in the Maharaja of Jaipur Museum*, Jaipur: Maharaja of Jaipur Museum, 1971, pp. 2–63 (Sanskrit), pp. 64–69 (Hindī), pp. 70–77 (Arabic and Persian), pp. 76–77 (Latin), p. 78 (Reserved Collection), and pp. 79–126 (details of important manuscripts).

<sup>25</sup>*Ibid.*, pp. 72–77; David A. King, "A Handlist of the Arabic and Persian Astronomical Manuscripts in the Maharaja Mansingh II Library in Jaipur," *Journal for the History of Arabic Science* 4, 1980, 81–86; and D. Pingree, "Indian and Islamic Astronomy at Jayasimha's Court," in D. A. King and G. Saliba, eds., *From Deferent to Equant*, New York: New York Academy of Sciences, 1987, pp. 313–328 (pp. 313 and 326, fn. 4).

<sup>26</sup>D. Pingree, "Sanskrit Geographical Tables," *IJHS* 31, 1996, 173–220.



## CATALOGUE A. VEDIC

The **JYOTIṢAVEDĀṄGA** in the Ṛk recension composed by Lagadha in Northwest India (Gandhāra?) in ca. -400. *CESS* A5, 538a–539a. Edited by S. Dvivedin, Benares 1908, pp. 61–69. The first verse is:

pañcasamvatsaramaya-  
yugādhyakṣam prajāpatim |  
dinartvayanamāsāṅgam  
praṇamya śirasā śuciḥ ||

### Manuscripts:

1. Puṇḍarīka veda 262. Ff. 1–3. 11 × 25 cm. 8/9 lines. Copied by Rāmabhāṭa on Monday 9 October 1797, perhaps at Kāśī (at the beginning is: śrīgaṇeśāya namaḥ || śrīkāśīviśveśvarāya namaḥ).

Colophon on f. 3v: iti jyotiṣa samāptaḥ.

Post-colophon: samvata 1854 kārtikavadya 4 imduvāsare.

On f. 1 is written: idaṃ pustakaṃ rāmabhāṭena likhitaṃ.

2. Puṇḍarīka veda 261. Ff. 1–3. 9.5 × 22.5 cm. 9–11 lines. Some marginal notes. Perhaps copied in Kāśī.

Colophon on f. 3v: iti jyotiṣaḥ samāptaḥ.

After this is written: pañcasamvatsaram prapadyate kāryāḥ kalā daśa ca yāḥ parva savitāviṣuṣam sapta || śrīkāśīviśveśvarārpanam astu.

After this a second scribe has written:

kālimdīpulinīsuradrumavanīvānīrakumjasthalīm  
pāhātāṃkarilājivāsicarilā ghorā kaṭhorā(ṇ)galīm  
prāleṇḍī navamī navīnavanītām joḍīm tulā anjali  
sākṣī he rajanī manojasajanī aisā harihāchali 1  
vegūnī guruśailasarvaśikhare<sup>a</sup> dvārāpagā laṃghunī  
prārgī lokapayodadṛṣṭikarakā vṛṣṭīm śīrīm sā unī  
cittīm darśanalālasādhharuniyām āleṃ aśīsāhaśī  
ātāpuṇyavaleṃ tu syā priyatamā ho ūnalokīm haśī 2

a. °śīre<sup>2</sup>kha<sup>1</sup>

## B. SIDDHĀNTAS

The **PAITĀMAHASIDDHĀNTA** presented as a conversation between Bhṛgu and Bhagavan (Brahma) and preserved in the *Viṣṇudharmottarapurāṇa* as adhyayas 168-174 of Khanda 2; it was composed in about 425. See CESS A4, 259a. Edited by V. Dvivedin in *Jyautiṣasiddhantasāgraha*, Benares 1912, fasc. 2, pt. 1. It begins: puskara uvaca | atha bhagavantam bhuvanotpattisthitisaṃharakarakam caracaragurum pratiyaśāsam samadhigamya bhṛgur vijñāpayāmāsa.

Manuscript:

3. Museum 43. Ff. 1-14. 12 x 26 cm. 9 lines.

Colophon on f. 14: iti viṣṇudharmottareṣu paitāmahasiddhāntaḥ samāptaḥ  
Price on f. 14v: kimati | ≡.

The **ĀRYABHAṬĪYA** composed by Āryabhaṭa at Kusumapura = Pāṭali-putra in ca. 500. CESS A1, 50b-53b; A2, 15b; A3, 16a; A4, 27b; and A5, 16a-17a. Edited with the ṭika, *Bhaṭadīpikā*, of Parameśvara by H. Kern, Leiden 1871. The first verse is:

praṇipatyaikam anekam  
kam satyam devatam param brahma |  
aryabhaṭas trini gadati  
gaṇitam kalakriyam golam ||

Manuscript:

4. Pothikhana 22. Ff. 1-41 and 9ff, of which the first 4 are numbered 1, 2, 4, and 5 (text continuous). 30.5 x 19.5 cm. European style book bound in cardboard covered with blue cloth having a flower design; hinged to left. Copied by the scribe of manuscripts 5, 17, and 35.

Ff. 1-41. The *Āryabhaṭīya* with the *Bhaṭadīpikā* of Parameśvara.

Colophon on f. 41: iti bhaṭadīpikayam golapādaḥ ity āryabhaṭīyam samāptaṃ.

After this is written: śāstroditai++++vāmsēś ca tāsām udayalagnam madhyalagnam astalagnam<sup>a</sup> ca samyag jñatvā punar arkasyārdhāstamaye ghaṭikāyamtram samsthapya tena kṛtikadinam + dyena kālana viśe + \* pratikañcuko yo 'sya iti pavaniyam dīpikavyakhyaya vyakaraṇaviruddhatvāt.

a. astalagnas

F. 41v. Blank.

Ff. (42-47). The *Āryabhaṭīya* alone except for the last verse of the *Bhaṭadīpikā* on f. (47):

paramadīśvarakhyena kṛteyam bhaṭadīpikā  
prachīyatam sada jyotiśśāstrajñanam hṛdālaye ||



Colophon on f. (47): iti bhaṭadīpikāyāṃ golapādaḥ ity āryabhaṭīyaṃ samāptam.

Ff. (47v–50v). Blank.

The **BHAṬADĪPIKĀ**, a commentary on Āryabhaṭa's *Āryabhaṭīya*, composed by Paramaśvara at Aśvatthagṛāma (= Ālattūr) in Kerala in ca. 1425. *CESS* A4, 189b–190a, and A5, 211b–212a. Edited by H. Kern, Leiden, 1874. The first verse is:

yattejaḥ prerayet prajñāṃ sarvasya śasībhūṣaṇam |  
mṛgaṭaṅkābhayeṣṭāṅkaṃ trinetraṃ tam upāśmahe ||

See manuscript 4.

The **ŚIṢYADHĪVRDDHIDATANTRA** composed by Lalla in Lāṭadeśa in the eighth or early ninth century. *CESS* A5, 545b–546b. Edited by S. Dvivedin, Kāśī 1886. The first verse is:

natvā brahmaharitrinetradinakṛcchītāṃśubhūnandana-  
prāleyāṃśusutendramantribhṛgujacchāyāsutebhānanān |  
ācāryāryabhaṭoditaṃ suviṣamaṃ vyomaukasāṃ karma yac  
chiṣyānāṃ abhidhīyate tad adhunā lallena dhīvrddhidam ||

Manuscript:

5. Pothikhānā 23. Ff. A–B; ff. 1–25 and (26); f. C; ff. 27–30, 30b, 31–39; and ff. D–E. 30.5 × 19.5 cm. 26 lines. European style book bound in cardboard covered with blue cloth having a flower design; book hinged to left. Copied by Līchamīnārāyaṇa at Surata on Wednesday 10 July 1895; he also copied manuscripts 4, 17, and 35. With Dvivedin's footnotes.

Ff. A–Av. Table of contents.

Ff. B–Bv. Blank.

Ff. 1–(26). Grahagaṇitādhyāya.

Ff. 26v and C–Cv. Blank.

Ff. 27–39. Golādhyāya.

Colophon on f. 39: iti śrīlallācāryaviracite śiṣyadhīvrddhide mahātantre gole praśnādhyāyaḥ samāptaḥ || samāpto 'yaṃ śiṣyadhīvrddhidah

Post-colophon: līchamīnārāyaṇa lekḥata pothiṣānā suratāṣānā kī mī° śā° va° 5 sam° 1952 vāra vudhavāra°.

Ff. 39v and D–Ev. Blank.

The **SŪRYASIDDHĀNTA** in the form of dialogue between Maya and Sūrya, composed in ca. 800. *CESS* A6. Edited with the ṭikā, *Gūḍhārthaprakāśaka*, of Raṅganātha by F. Hall, Calcutta 1859. The first verse is:

acintyāvaktarūpāya nirguṇāya guṇātmane |  
samastajagadadharamurtaye brahmaṇe namaḥ ||

#### Manuscripts:

6. Khasmohor 5360. Ff. 1-15. 11.5 x 26 cm. 14/15 lines. With some marginal notes. Copied by Sahajasundara, the pupil of Saravaṇa Gaṇi, the pupil of the Mahopādhyaya Mativilāsa of the Maladhāragaccha, for himself at Argalapura (= Agra) on Monday 16 November 1579 during the reign of Pātīsāhi Jalaladīni Akavvara.

Colophon on f.15v: iti śrisūryasiddhānte mayāsurasamvāde prajāpatyavira-  
cite manādhyāyas trayodaśakah

Post-colophon: samvat 1636 barṣe | mārgasiravadi 13 somavāsare śrīmāla-  
dhāragacche | mahopādhyāyaśrīmativilāsa | tacchisyaga° śrisaravaṇa | tac-  
chisyana° śrisahajasundara atmārtham svayam ālekhi || śrīargalapuramadhye  
| patīsāhiśrījalaladīni akavvararājye.

After this is written in the scribe's orthography:

lagnasṛṣṭikaṭigrīva || baddhadṛṣṭir adhonmukham |  
kastena likhitam śāstram yatnena paripālayet || 1  
tailād ṛkṣe jalad ṛkṣe | d ṛkṣe śīthilabamdhanaṭ |  
mūṣahaste na datavyam | evaṁ vada (here it ends).

7. Puṇḍarīka jyotiṣa 2. Ff. 1-31. 11.5 x 27 cm. 10 lines. Some folios stuck together. Copied at Pharatapura on Tuesday 1 November 1642.

Colophon on f. 31v: iti śrisūryasiddhānte mayāsurasamvade prajāpatyavi-  
racite manādhyāyaś caturdaśamah ||14||.

Post-colophon: samvat 1(6)99 varṣe mārgasirvadi 5 bhaumavāsareḥ || phara-  
tapuramadhye likhitam.

8. Khasmohor 5403. Ff. 1-28, 28v, and 29-34. 11.5 x 24 cm. 8 lines. Copied by Vallabha Bhaṭṭa at Avantipurī on Tuesday 3 July 1705.

Colophon on f. 34: iti sūryasiddhānte mānādhyāyaś caturdaśaḥ || samāpto  
yam grāṁthah.

Post-colophon: samvat 1762 miti śrāvaṇamāse kṛṣṇapakṣe navamyām bhaū-  
mavāsare li. bhaṭṭavallabhena avantipurīyyām.

Price on f. 1: kimati ||| =.

9. Khasmohor 5139. Ff. 1-17. 13 x 24 cm. 10 lines. With occasional prsthamaṭras. With the *bhāṣya* of Caṇḍeśvara. Copied by Nātha, the son of Viṭṭhala Bhaṭṭa of the Medapāṭhajñāti, a resident of Rūpapura, for Jayasimha from AS Bombay 293 I in Gujarāta on Saturday 9 November 1706. Incomplete (end of adhyāya 10 to the end of adhyāya 11).

F. 1v begins at the end of the *bhāṣya* on 10, 15: saṃpūrṇṇaśuklā syāt || cha ||

Colophon of adhyāya 10 follows: iti śrīmaithilavājapeyasomayājīśrīcaṇḍeśvarācāryaviracite sūryasiddhāntabhāṣve paurṇamāsī caṇḍraśṛṅgonnatir ddaśamo dhyāyaḥ || samāptaḥ.

Colophon on f. 17: iti śrīmaithilavājapeyasomayājīśrīcaṇḍeśvarācāryaviracite sūryasiddhāntabhāṣye vyatipātavaidhṛtādhyāya ekādaśaḥ samāptaḥ.

Post-colophon: saṃvat 1763 varṣe kārṭtikamāse suklapakṣe puṇyamāsī śanivāsare gujarātamadhye rūpapurame vāstavyaṃ medapāṭhajñātīyabha° viṭhala-sūtanāthena laṣitaṃ idam pustakaṃ || || māhārājādhirāja gau brāhmaṇa prati ciraṃjivah°.

a. after ciraṃ° ji is written, but crossed out.

Price on f. 1: kīmatī | ≡ j.

10. Khasmohor 5013. Ff. 1–63, 63b(=64), and 65–72. 13 × 23.5 cm. 10 lines. With the *bhāṣya* of Caṇḍeśvara. Copied by Nātha, the son of Viṭhala Bhaṭṭa of the Medapāṭhajñāti, from AS Bombay 293 II at Rūpapura in Gujara on Saturday 30 November 1706. Incomplete (adhyāyas 12–14 numbered (11), 12, and 13).

F. 1v begins in 12, 1a (p. 194, 5): athārkāṃśamahābhūtaṃ.

Colophon on f. 72: iti śrīmaithilavājapeyasomayājīśrīcaṇḍeśvarācāryaviracite sū<sup>11</sup>ryasiddhāntabhāṣye trayodaśo<sup>11</sup> 'dhyāyaḥ samāptaḥ.

Post-colophon: saṃvat 1763 varṣe mārgaśīrasamāse śuklapakṣe śaṣṭīdine śanivāsarena laṣitaṃ medapāṭhajñātī bha°viṭhala-sūtanāthena laṣitaṃ idam pustakaṃ gujaramadhye rūpaparamadhye vāstavyaṃ || || cha || || samāpto yaṃ graṃtha ||

Price on f. 72v: kīmatī ¶ || ≡ || j.

11. Khasmohor 5302. Ff. 1–34. 11 × 26.5 cm. 9 lines. Copied by Tulārāma for Mahārājādhirāja Jayasīṃha on Saturday 1 March 1707.

Colophon on f. 34: iti śrīsūryasiddhānte mānādhyāyaś caturdaśaḥ.

Post-colophon: śrīmanmahārājādhirājajīśrījayasīṃhadevajīkasyājñayā li. tulārāmeṇa saṃ 1763 mīti phālgunaśukla 9 śanau.

12. Khasmohor 5142. Ff. 1–3, 3b, and 4–25. 11.5 × 25 cm. 10–12 lines.

Colophon on f. 25 :iti śrīsūryasiddhānte mānādhyāyaś caturdaśaḥ || 14 || samāptim agat.

13. Khasmohor 5145. Ff. 1–34. 11.5 × 23 cm. 9–11 lines. With marginalia. Ff. 1–11 and 13–34 brown paper; f. 12 white paper. 11.5 × 22.5 cm. 9 lines, supplied by first scribe.



Colophon on f. 23v: iti śrīsūryasiddhāṁte mānādhyāyaś caturdaśaḥ || 14 || samāptā.

14. Khasmohor 5187. Ff. 1–53. 12 × 28 cm. Tripāṭha. With some marginal notes. With the ṭikā, *Sauravāsanā*, of Kamalākara. Incomplete (adhyāyas 1–11).

Colophon of the mūla on f. 53: iti sūryasiddhāṁte pātādhikāraḥ samāptaḥ.

Colophon of the ṭikā on f. 53: iti śrīsakalagaṇakasārvabhaumaśrīmānṛ-siṃhātmaajakamalākaraviraviracitā daśādhikārāṁtaṃ pūrvakhaṇḍa sauravāsanā saṃpūrṇā.

15. Khasmohor 5190. Ff. 1–24 and 26–48 (text continuous). 12.5 × 27 cm. 10 lines. With the ṭikā, *Gūḍhārthaprakāśaka*, of Raṅganātha. Incomplete (adhyāyas 12–14).

f. 1v begins, after the salutations, with the beginning of the ṭikā on adhyāya 12 (p. 294, 1): mahādevaṃ.

Colophon on f. 48: iti śrīsakalagaṇakasārvabhaumavallāladaivajñātmajarāṃganāthaviracitaḥ sūryasiddhāṁtagūḍhārthaprakāśakaḥ saṃpūrṇaḥ.

After this is written: grathasaṃkhyā 15 atra pūrvottarārddhayo mitilitvā grathasaṃkhā sapādapaṃcasahasramitā 1350.

16. Khasmohor 5573. Ff. 1–27 and 1 blank folium. 12 × 31 cm. 9 lines.

Colophon on f. 27v: iti śrīsūryasiddhāṁte mayāsurārkkāṃśasaṃvāde mānādhyāyaḥ || 12 || samāpto yaṃ sūryasiddhāntaḥ.

17. Pothikhānā 24. Ff. A–B, ff. 1–29(=pp. 1–58), and ff. C–E. 30.5 × 18.5 cm. 19 lines. European style book bound in cardboard covered with blue cloth having a flower design; hinged to left. Copied by the scribe of manuscripts 4, 5, and 35.

Ff. A–B. Blank.

F. Bv. Index of chapters.

Colophon on f. 29v: iti sūryasiddhānte mānādhyāyaḥ || || samāptaś ca sūryasiddhāntaḥ.

Ff. C–Ev. Blank.

The **SŪRYASIDDHĀNTABHĀṢYA**, a commentary on the *Sūryasiddhānta* composed by Caṇḍeśvara in Mithilā in 1185. *CESS* A3, 40b–41a, and A5, 105b. The first verse is:

namas te paramātmaikarūpāya paramātmāne |  
svecchāvabhāsitāśeṣadehābhinnāya śambhave ||

See manuscripts 9 and 10.

The **SŪRYASIDDHĀNTAṬĪKĀ** composed by Kṛṣṇa at Kāśī in 1584. *CESS* A5, 48a–48b. The first verse is:

prañamya jagadādhāraṃ nirādhāraṃ ca nirguṇam |  
saguṇam kṛṣṇam akrṣṇam kṛṣṇo vyākhyāti sūryoktim ||

Manuscript:

18. Puṇḍarīka jyotiṣa 1. Ff. 1–27 and 29–53 (ff. 15–26 also numbered 1–12 in upper left margin of versos). 11 × 25 cm. 12/13 lines. Incomplete (adhyāyas 1–11; opening verses and final colophon omitted).

F. 1v begins, after salutations: atha sūryasiddhāntodāharaṇam likhyate | tatra spaṣṭikaraṇāḍau madhyamagrahasyopayogāt tasyāpy ahargaṇasādhyatvād ādāv ahargaṇaḥ sādhyate || samvat 1641 śālivāhanaśāke 1506 kārttikapaurṇamāsyām śanau.

F. 27v ends in the ṭikā on 4, 8: ābhyāṃ saumyo vikṣepaḥ 3|30 avaśi.

F. 29 begins in the ṭikā on 4, 26(?): yasya katham api katham vā | kuto hetor ity artha ||

The text ends on f. 53: paścāt tāḥ ghaṭikā mānayaogārdhaliptābhir guṇanīyāḥ pūrvānītakrāṃtyaṃtareṇa bhājyā labdhaghaṭikādi sthityarddham bhavati ||

After this is written:

daśāsyasya puryāḥ śārārkai(h) 125 kumārī  
tato yojanaiḥ khāṣṭabhiḥ 80 kāmṭikāṃcī ||  
tataḥ paṃcarāmai35ś ca mallāradhātrī  
gajaiḥ 8 paryalī khemḍubhi(h)10r vatsagulmaṃ || 1 ||  
khabānai(h)50r avamṭī kurukṣetram asyāḥ  
kharudraiś ca 110 tattvāṣṭatulyaiḥ 825 sumeruḥ ||  
bhaved aṃtaram merulaṃkānagaryos  
tathādhiṣṭhitam jyotiṣādye bhacakram || 2 ||  
sarvayojanāni 1243 ||

F. 53v. Blank.

Another scribe has written upside down on f. 1r:

tithir na doṣo udaye ca kāle  
nakṣatradoṣo abhijin na caivam ||  
yogo na doṣo (')stamaye ca kāle  
na vāradoṣaḥ prabhavaṃti rātrau |

A third scribe has written in the margin of f. 29v:

śāko vedanavāśvi1294caṁdraviyuto (')dha(h)stho tribhābhyāṁ 3/27 yuto  
 sa [(bhayuktaḥ)] dvāviṁśatabhi(r) 22 hata(h) śarādrīdhṛtibhi(r) 1875 la-  
 bdhāṣṭavedānvita(h) 48 ||  
 ṣaṣṭyā 60 tatpariśeṣitād iha samāśeṣaṁ kramāt tādayen  
 māso dvādaśabhiḥ 12 khavahnibhi30r ahaṣṣaṣṭy(ā) 60 ca daṁḍāda-  
 yah || 1 ||

The **GŪDHĀRTHAPRAKĀŚAKA**, a ṭikā on the *Sūryasiddhānta* com-  
 posed by Rāṅganātha at Kāśī in 1603. *CESS* A5, 388b–389a. Edited by Fitzed-  
 ward Hall, Calcutta 1859. The first verse is:

yatsmṛtyābhīṣṭakāryasya nirvighnāṁ siddhim eṣyati ||  
 naras taṁ buddhidaṁ vande vakratuṇḍaṁ śivodbhavam ||

See manuscript 15. Another manuscript:

19. Khasmohor 5189. Ff. 1–197. 12 × 27 cm. 9/10 lines. Incomplete  
 (adhyāyas 1–11).

Colophon on f. 197: iti śrīsakalagaṇakalagaṇakasārvabhauma vallāledevajñā-  
 tmajaraṅganāthagaṇakaviracite gūṭārthaḥ kāsake pūrvakhaṇḍa paripūrtipag-  
 agamat.

After this is written: graṁthasaṁkhā catuḥsahasrā.

The **SAURABHĀṢYA**, a ṭikā on the *Sūryasiddhānta* composed by Nṛsiṁha  
 at Vārāṇasī in 1611. *CESS* A3, 204a–205a; A4, 162b–163a; and A5, 202b. The  
 first verse is:

pratyudavyūhavidhvaṁsakāraṇāya mahātmane ||  
 gaṇeśāya namas tasmai jagatām eva sākṣiṇe ||

Manuscript:

20. Khasmohor 5188. Ff. 1–120. 12.5 × 27.5 cm. 10 lines. Normally only  
 lemmata from the mūla. Copied on ca. 4 July 1731.

Colophon on f. 120: iti śrīnṛsiṁhagaṇakaviracitaṁ sūryasiddhāntabhāṣyaṁ  
 samāptaṁ.

After this is written: graṁthasya saṁkhyā 'nuṣṭubhā puṣkaraviṣṇupadabhā-  
 vakṛṣṇavartmatulyā 310.

yādṛśaṁ pustakaṁ dṛṣṭvā tādṛśaṁ likhitaṁ mayā |  
 yadi śuddham aśuddham vā mama doṣo na dīyate ||



There follows the date-formula: samvat 1788 āṣyāḍhaśudī ekādaśī ke pustaka samāpta.

The **SAURAVĀSANĀ**, a ṭikā on adhyāyas 1–11 of the *Sūryasiddhānta* composed by Kamalākara at Kāśī in ca. 1660. *CESS* A2, 23a; A4, 33b; and A5, 22a. Edited by Śrīcandra Pāṇḍeya, Vārāṇasī 1991. The first verse is:

brahmāṇḍagolodaragaṃ khasaṃsthaṃ  
bhāntaṃ samastaṃ jalagolarūpaṃ ||  
yattaijaṣaṃ bhāti yataḥ sadā taṃ  
nārāyaṇaṃ maṇḍalagaṃ namāmi ||

See manuscript 14. Another manuscript is:

21. Khasmohor 5592. Ff. 1–38 and 40–93. 11.5 × 26 cm. 8 lines. Copied by Nātha Bhaṭṭa, the son of Viṭṭhala Bhaṭṭa of the Medapāṭhajñāti, at Rūpapura in Gujarāta for the reading of the boys in the saṅgha of Mahārāja Jayasimha, on Saturday 31 August 1706. Incomplete.

F. 38v ends in the ṭikā on 3, 22–24 (p. 43, 4): svachāyotthaka.

F. 40 begins in the ṭikā on 3, 26c–27b (p. 43, 28): hnā(rkasya chāyā).

Colophon on f. 93: iti śrīsakalagaṇakasarvabhaumaśrīmanṛsiṃhātmaśrīkamalākaraviracitā daśādhikārāṇṭapūrvakhaṇḍasauravāsanā saṃpūrṇā.

Post-colophon: samvat 1763 varṣe bhādrapadamāse śuklapakṣe caturthi śanivāsarena gujarātamadhye rūpapuramadhye vāstavyaṃ medapāṭhajñātiyabha. viṭthalasūtabha. nāthena laṣitaṃ pustakaṃ paṭhanārthaṃ mārājādhirājagau-brāhmaṇapratipālaka chatrādhipatiśrīśrīmahārājā jeyasaṅghaputrapaṭhanārthaṃ.

The **SIDDHĀNTAŚIROMANI** composed by Bhāskara at Vijjaḍaviḍa in 1150. *CESS* A4, 311b–319a, and A5, 258b–260a. The grahagaṇitādhyāya was edited by D. V. Āpaṭe with Bhāskara's own *Vāsanābhāṣya* and Gaṇeśa's *Śiromanīprakāśa* as *ASS* 110, 2 vols., Poona 1939–1941; the madhyamādhikāra with the *Marīci* of Munīśvara was edited by M. Jhā, Varanasi 1961; and the spaṣṭa to pāta with the *Marīci* of Munīśvara by K. Joshi, 2 vols, Varanasi 1964. The first verse is:

yatra trātum idaṃ jagaj jalajinibandhau samabhyudgate  
dhvāntadhvaṃsavidhau vidhautavinaman niḥśeṣadoṣoccaye |  
vartante kratavaḥ śatakratumukhā dīvyanti devā divi  
drāṇ naḥ sūktimucaṃ vyanaktu sa girāṃ gīrvāṇavandyo raviḥ |

The golādhyāya was edited by D. V. Āpaṭe with Bhāskara's own *Vāsanābhāṣya* and Munīśvara's *Marīci* as *ASS* 122, 2 vols., Poona 1943–1952. The first verse is:

siddhiṃ sādhyam upaiti yatsmaraṇataḥ kṣipraṃ prasādāt tathā  
 yasyāś citrapadā svalaṅkṛtir alaṃ lālityalīlāvatī |  
 nṛtyantī mukharaṅgageva kṛtināṃ syād bhāratī bhāratī  
 taṃ tām ca praṇipatya golam amalāṃ bālāvabodhaṃ bruve |

#### Manuscripts:

22. Khasmohor 5489. Ff. 1-17, 19-21 corrected to 18-20, and 21-84. 11 x 21.5 cm. 19 lines. With occasional marginalia. The grahagaṇitādhyāya with Bhāskara's *Vāsanābhāṣya*. Copied by Lakṣmaṇa Bhaṭṭa, the son of Kamalākara Bhaṭṭa, the son of Padmākara of the Jāmadagnigotra, on Thursday 22 January 1652. Formerly property of Lakṣmaṇa Josyā, who is probably the scribe.

Colophon on f. 84v: iti śrīmaheśvaropādhyāyasutaśrībhāskarācāryaviracite siddhāntaśiromaṇau vāsanābhāṣyamitākṣare pātādhyāyaḥ samāpto (yaṃ) graṃthaḥ.

After this is written: atrādhikāre graṃthasaṃkhyā catvāriṃśadadhikaṃ śatatrayaṃ 340 || samastagraṃthasaṃkhyā ṣaṭsārdhasahasrasaṃkhyā 6500.

There follows the date formula:

guṇaśailasāgarabhūmitaśāke śrīśālivāhanākhye ca ||  
 tapamāsi kṛṣṇapakṣe saptamyām imdrapūjite vāre || 1 ||  
 śrījāmagnyagotrodbhavaśrīmadpadmākarasya tanujo (')bhūt ||  
 śrikamalākaraḥbhaṭṭasutaḥ lakṣmaṇa[m] ālekhi vāsanābhāṣyaṃ || 2 ||

...saṃvat 1708 śāke 1573 māghakṛṣṇa 7 gurau śrīmatpaṇḍitavaryapadmākara-  
 bhaṭṭasūnuśrīmatkama(lā)karabhaṭṭasūnuna

lakṣmaṇabhaṭṭena likhitā mitākṣarā.

Below this is written:

madhyamādhikāra	900
spastādhikāra	600
tripraśna	925
parvasaṃbhava	75
caṃdragrahaṇa	340
sūryagrahaṇa	325
chāyādhikāra	190
astodaya	100
śrīṅgonnati	310
grahayuti	85
bhagrahayuti	130
pātādhyāya	340
yogaḥ	4320
golādhyāy	2200
sarvayogaḥ	6520
iyam sarvagraṃthasaṃkhyā	

23. Khasmohor 5488. Ff. 1-46. 11 × 21.5 cm. 16-21 lines. With some marginalia. The golādhyāya with Bhāskara's *Vāsanābhāṣya*. Copied by Lakṣmaṇa Bhaṭṭa, the son of Kamalākara Bhaṭṭa, the son of Padmākara Bhaṭṭa, on Sunday 21 September 1651.

Colophon on f. 46: iti śrīmaheśvaropādhyāyasutaśrībhāskarācāryaviracite siddhāntaśiromaṇo golādhyāyavāsanābhāṣye jyotpatyādhyāyah.

Post-colophon: samvat 1708 śāke 1573 kharanāmasamvatsare kārṭtikakṛṣṇa 2 ravidine śrīmatpadmākaraḥṭṭasūnukamalākaraḥṭṭasūnuna lakṣmaṇena li-khitam idaṁ pustakaṁ.

Below this is written a passate dated Wednesday 26 March 1617: atha kalpagataṁ likhyate (|) śālivāhanaśāke 1539 piṅgalābde pātaḥ (|) saṁ manavaḥ 1840320000 saṁmanūnāṁ sapta saṁdhyāsaṁdhyāṁśāḥ 12096000 (|) saptaviṁśati mahāyugāni 116640000 (|) kṛtayugaṁ 1728000 tretā 1296000 dvāpara 864000 (|) yudhiṣṭhiraśāka 3044 vikramaśāka 135 śālivāha(na)śāke 1539 (|) trayāṇāṁ yoge gatakaliyugaṁ 4718 (|) evaṁ sarveṣāṁ yoge jātāṁ kalpagataṁ 1972948718 (|) asmād grahānayanāṁ yathā śāke 1539 piṅgalābde caitrasuddha 1[1] budhe dhanīṣṭā 50 śobhana 27 di 31|44 madhyarātrau sūryasiddhāntād varttārakaḥ(?) (|) kalpagataṁ 1972948718 (|) tatra brahmaṇaḥ grahanakṣatrādisṛṣṭau gatakālāt divyābdāni 47400 (|) tāni ṣaṣṭyadhikaśatatrayagu360ṇitāni sauravarṣāni 17064000 (|) ete śodhyābdāḥ kal(p)agate śodhitā jātā sṛṣṭyādigatābdāḥ saurāḥ 1955884718 (|) asmāt sṛṣṭyādyahargaṇaḥ sādhyate.

On the bottom cover are written parameters of the *Sūryasiddhānta*.

grahabhagaṇāḥ	
ravibha	4320000000
caṁdrabha	57753336000
bhaumabha	2296832000
budhabha	17937060000
guru	364220000
śukra	7022376000
śani	146568000

uccabhagaṇāḥ		pātabhagaṇāḥ	
ra	387	caṁ	232238000
caṁ	488203000	bhau	214
bhau	204	vu	488
vu	368	gu	114
gu	900	śu	903
śu	535	śa	6620
śa	39		

nakṣatrodayāḥ	1582237828000
kudināni	1577917828000



camdrāhāḥ	1603000080000
adhimāsāḥ	1593336000
avamāḥ	25082252600
ravimāsāḥ	[1]51840000000
khakakṣāḥ	187120808640000000

ete yathā sambhavaṃ sahasrabhaktāḥ mahāyuge 4320000 bhagaṇāḥ syuḥ  
idaṃ bhagaṇādi brahmasiddhāntasūryasomaromaśavasisthavyāśasiddhānt(e)-  
bhyāḥ likhitam

atha kalpapramāṇam 4320000000 tadyathā kṛta 1728000 tretāpra 1296000  
dvāpara 864000 kalipra 432000 eṣāṃ caturṇām yoge mahāyugam 4320000 ebhir  
ekasaptabhi(r) mahāyugair jāto manu[h] pramāṇam 306720000 caturdaśama-  
nūnām saṃdhyā saṃdhyāṃśāḥ kṛtapramāṇāḥ 1728000 etatsaṃdhyāsaṃdhyāṃ-  
śasahitacaturdaśamanūnām yoge jātāni sahasramahāyugāni idam eva brahma-  
dinam kalpaś ca 4320000000.

24. Khasmohor 5593. Ff. 1–131 and 131b–134. 12 × 27.5 cm. 12 lines. Brit-  
tle paper; some leaves damaged. With some marginalia. The grahagaṇitādhyāya  
with Bhāskara's *Vāsanābhāṣya*. Copied for Satīdāsa, the son of Śrīdatta Jy-  
otirvit, on Saturday 12 January 1657.

Colophon on f. 134: iti śrīmaheśvaropādhyāyasutabhāskarācāryaviracite  
siddhāntaśi(romaṇivāsanā)bhāṣye  
mitākṣare pātādhyāyāḥ (the akṣaras within pointed brackets are lost in tears  
in this damaged leaf).

After this is written: gaṇthaḥ 440.

Post-colophon: jyotirvichrīdattātajasatīdāsapaṭhanā(rtham saṃvat 1)713 śa-  
ke 1578 pravarttamāne māghamāsiyaśuklapakṣe dvādaśyām maṇḍavāsare.

Price on top cover and in margin of f. 134v: kī 31 ṛj.

25. Khasmohor 5205. Ff. 1–25. 10 × 23.5 cm. 10/11 lines. With some  
marginalia. The yantrādhyāya from the golādhyāya with Bhāskara's *Vāsanā-  
bhāṣya*. Copied on Monday 3 June 1706. Formerly property of Jayakṛṣṇa Dī-  
kṣita, the son of Śrīkṛṣṇa Dīkṣita.

F. 1 begins, after the salutation, with the heading to yantrādhyāya 1 (p.  
360, 12 of vol. 2 of the Āpaṭe ed.): atha yantrādhyāyo.

Colophon on f. 24v (cf. p. 427, 5–6): iti śrīmaheśvaropādhyāyasutabhāska-  
rācāryaviracite siddhāntaśiromaṇi(corr. to °ṇi)vāsanābhāṣye mitākhye yantrā-  
dhyāyaś caturdaśamaḥ.

After this is written: asmi[f. 25]nn adhyāye gaṇthasaṃkhyā vi(m)śatya-  
dhikaṃ śatatrayam 320.

Post-colophon: saṃvata 1763 śāke 1628 pravarttamāne āṣāḍhasudī caturthī  
4 camdravāsare likhitam.

Ownership note: dikṣata śrīkṛṣṇasutadikṣataje kṛṣṇasya pustakam.

After this are enumerated members of this family: dikṣata jīvo dikṣata kaḍvo dikṣata kāśī dikṣata śrīvacaḥ dikṣata jīvarāja dikṣata śrīkṛṣṇa dikṣata jekṛṣṇa.

Price on f. 25v: kī || – |||.

26. Khasmohor 5309. Ff. 1–45 and 47–181. 12 × 26.5 cm. 10–12 lines. Grahagaṇitādhyāya with Bhāskara's *Vāsanābhāṣya*. Copied by Tulārāma for Mahārājādhirāja Jayasimha on Thursday 8 September 1709.

Colophon on f. 181: iti śrīmaheśvaropādhyāyasutaśrībhāskarācāryaviracite siddhāntaśiromaṇau vāsanābhāṣya mitākṣare pātādhyāyaḥ samāptaḥ.

After this is written: atrādhikāre graṁthasaṁkhyā catvāriṁśadadhikaṁ śatatrayaṁ...

sarve te sukhinaḥ saṁtu sarve saṁtu nirāmayāḥ (|)

sarve bhadraṇi paśyaṁtu mā kaści(d) duḥkham āpnuyāt (||) 1 (||)

Post-colophon: śrīmanmahārājādhirājajīśrījayasighadevajīkasyājñayā likhitam idaṁ tulārāmeṇa ... saṁvat 1766 śake 1631 āśvinakṛṣṇa 1 gurau lekhaḥ.

27. Puṇḍarīka jyotiṣa 19. Ff. 1–5. 11 × 22.5 cm. 10 lines. Grahagaṇitādhyāya, madhyamādhikāra, kālamānādhyāya 15 with Munīśvara's *Marīci*. Copied by Dayārāma for Govinda Daivajña on Sunday 28 May 1727.

F. 1v begins, after the salutation: atha marīcibhāṣye kṛṣṇaśukrayor nirṇayam āha || There follows the heading to kālamānādhyāya 15 (p. 47, 3): atha kālasyānādyanaṁtatvād.

F. 5 ends (not in edition): pūrvācāryair varṣapravṛttir aṅgīkṛtā jātā dharmasāstravacanād iti.

Colophon on f. 5v: iti marīcibhāṣye kṛṣṇādiśuklādinirṇayaḥ.

Post-colophon: saṁ 1784 āṣāḍhakṛṣṇa 5 ravau dayārāmeṇa lekhi śrīmad-daivajñagovindasyārthe.

28. Khasmohor 5392. Ff. 1–131 (f. 52 is also numbered 23). 11 × 22 cm. 10 lines. With some marginalia. Golādhyāya with Bhāskara's *Vāsanābhāṣya*. Copied by Harinārāyaṇa Praśnorā, the son of Paṇḍita Joga, on Sunday 19 August 1733, probably at Kāśī.

Colophon on f. 131: iti śrīmaheśvaropādhyāyasutabhāskarācāryaviracite siddhāntaśiromaṇivāsanābhāṣye mitākṣare jyotpattiḥ samāptaḥ.

After this is written: śrīkāśīviśveśvarāpaṇam astu.

Post-colophon: saṁvat 1790 varṣe bhādirvā vadi 6 ravivāre liṣitaṁ paṁ jogātma japaśnorā harinārāyaṇena.

29. Khasmohor 5030. Ff. 1–11. 11 × 20.5 cm. 8 lines. With some marginalia. The tripraśnādhikāra of the grahagaṇitādhyāya. Incomplete.

F. 1v begins, after the salutation, with the adhyāya heading (vol. 1, p. 134, 2 of Āpaṭe's edition): *atha tripraśnādhyāyaṃ vivaktus tāvat tadāraṃbhaprayojanam āha.*

F. 11 ends, half through line 1, with 73d (vol. 1, p. 189, 17): *cāpamo taḥ || 73 ||*

30. Khasmohor 5391. Ff. 1–42. 11 × 22 cm. 8 lines. With marginal notes. *Grahagaṇitādhyāya*. Incomplete (ends in *parvasambhavādhikāra*).

F. 42v ends in *parvasambhavādhikāra* 2b (vol. 2, p. 2, 2 of Āpaṭe's edition): *169 yu.*

31. Khasmohor 5439. Ff. 1–11 and 13–16 (f. 13 torn). 11 × 30 cm. 12 lines. *Golādhyāya* with Bhāskara's *Vāsanābhāṣya*. Incomplete (ends in the *jyotpattivāsanā*).

F. 11v ends in the heading to *madhyagativāsanā* (vol. 1, p. 115, 8 of Āpaṭe's edition): *idānīm.*

F. 13 begins in *madhyagativāsanā* 23a (numbered 22 in manuscript)(vol. 1, p. 126, 12): *dayakālikās.*

F. 16v ends in the *ṭikā* on *jyotpattivāsanā* (vol. 1, p. 137, 23): *trijyāyutena 100.*

The **VĀSANĀBHĀṢYA** or **MITĀKṢARA**, a commentary on his own *Siddhāntaśiromoṇi* composed by Bhāskara at Vijjaḍaviḍa in *ca.* 1150. *CESS* A4, 319a–322a, and A5, 260a–261a. The first verse of the *ṭikā* on the *grahagaṇitādhyāya* is:

jayati jayati gūḍhānandhakāre padārthān  
janaghanaghrṇayāyaṃ vyañjayann ātmabhābhīḥ |  
vimalitamanasām sadvyāsanābhyaśayogair  
api ca paramatattvaṃ yoginām bhānur ekaḥ ||

The first verse of the *ṭikā* on the *golādhyāya* is:

golādhyāye nīje yā yā apūrvā viśamoktayah |  
tās tā bālāvabodhāya saṃkṣepād vivṛṇomy aham ||

See manuscripts 22, 23, 24, 25, 26, 28, and 31. Other manuscripts:

32. Khasmohor 5245. A ff. 1–38, 40–46, 49–64, 63b, 63c, 64b, and 65–74 (text continuous); and B ff. 1–59, 63 (corrected to 59(b)), 60–62, 59c (corrected to 63), and 65 (ff. 16–32 also numbered 1–17; ff. 38–59 also numbered 1–22; f. 59b also numbered 24; and f. 65 also numbered 28). 11.5 × 28 cm. 7/8 lines.



Lemmata ususally from the mūla. Grahagaṇitādhyāya. Incomplete. B f. 65 apparently belongs to a different manuscript.

A f. 74 ends in the heading to tripraśnādhikāra 5 (vol. 1, p. 135, 7 of Āpaṭe's edition): idānīm lagnāt kālā.

B f. 1 begins in parvasambhavādhikāra 1a (vol. 2, p. 1, 7): kale gatābdā.

B f. 59c(corrected to 63)v ends in the ṭikā on grahayutyadhikāra 7–9 (vol. 2, p. 119, 4): kiṃ tu yal la.

B f. 65 begins in the ṭikā on madhyamādhikāra, pratyabdaśuddhi 10 (vol. 1, p. 52, 20): va śaśīty upannaṃ.

B f. 65v ends, in the middle of line 7, in the ṭikā on madhyamādhikāra, pratyabdaśuddhi 12a–b (vol. 1, p. 54, 5): śuddhitve.

33. Khasmohor 5390. Ff. 1–57, 57b–78, and 78b–142 (ff. 57v, 57b, and 78bv are blank). 10.5 × 22 cm. 10 lines. With marginal notes. Golādhyāya. Usually lemmata from the mūla.

Colophon on f. 142: iti śrīmaheśvaropādhyāyasutabhāskarācāryaviracite si-ddhāntaśiromaṇau vāsanābhāṣye mitākṣare golādhyāye jyotpatyadhyāyaḥ.

The **MARĪCI**, a commentary on Bhāskara's *Siddhāntaśiromaṇi* composed by Munīśvara Viśvarūpa at Kāśī in ca. 1638. *CESS* A4, 436b–438b, and A5, 314a. The first verse is:

prātarbodhitapadmapatravikasannetro navīnāmbuda-  
śyāmaḥ pītadukūlaśobhitatanuḥ śrīvatsamudrānvitaḥ |  
vaṃśīvādanatatparo ravisutātīropago naicakī-  
gopībhiḥ pariveṣṭito mama manasyāstāṃ ramāvallabhaḥ ||

See manuscript 27.

The **SIDDHĀNTAŚIROMANYUDĀHARAṆA**, a commentary on the grahagaṇitādhyāya of Bhāskara's *Siddhāntaśiromaṇi*, composed by Viśva-mbhara (*CESS* A5, 689a), known as Cakracūḍāmaṇi (*CESS* A3, 36b). The beginning is not known.

Manuscript:

34. Puṇḍarīka jyotiṣa 6. Ff. 4–42 and 44–96 (text continuous). 11 × 23 cm. 7 lines. Incomplete.

F. 4 begins in the ṭikā on madhyamādhikāra, grahabhagaṇamānādhyāya 6a–b: caṃdrapātāḥ 2223111681 maṃ° pātāḥ 267.

Colophon on f. 96: iti śrīvājidaivajñacakracūḍāmaṇiviśvaṃbharaviracite si-ddhāntaśiromaṇyudāharane pātādhikāraḥ.

The **BRAHMASIDDHĀNTA** alleged to be part of a *Śākalyasaṃhitā* and attributed to Brahman. *CESS* A4, 259a–260a, and A5, 240b–241a. Edited by V. Dvivedin as part 2 of fasc. 1 of his *Jyautiṣasiddhāntasaṅgraha*, *BSS* 39, Benares 1912. The first verse is:

dhyānayogasamārūḍhaṃ brahmāṇaṃ trijagadgurum |  
abhivādya sukhāsinaṃ nāradaḥ paripṛcchati ||

Manuscript:

35. Pothikhānā 25. Ff. A–B, 1–23, and C. 30.5 × 19.5 cm. 26/27 lines. European style book. With some marginal notes. Copied by Līchamīnārāyaṇa at Surata on ca. 24 August 1895. He was also the scribe of manuscripts 4, 5, and 17.

Ff. A–Bv. Blank.

Colophon on f. 23: iti śrīśākalyasaṃhitāyāṃ dvitīyaḥ praśne vrahmasiddhāntaḥ saṣṭo dhyāya samāpta.

Post-colophon: ka° līchamīnārāyaṇa lekhata pothī° surata° mī° bhā° di 5 saṃ 1952.

Ff. 23v–Cv. Blank.

The **VRDDHAVASIṢṬHASIDDHĀNTA** = **VIŚVAPRAKĀŚA** in the form of a dialogue between Vāmadeva and Vasiṣṭha. *CESS* A5, 608a–608b. The first verse is:

namas te viśvarūpāya parāya paramātmāne |  
yogidhyeyāya śāntāya kālarūpāya viṣṇave ||

Manuscript:

36. Puṇḍarīka jyotiṣa 4. Ff. 1–38 and A. 11 × 21.5 cm. 10 lines. Includes on ff. 35v–38v two chapters additional to the thirteen of the gaṇitaskandha: a golabandhādhyāya and an abhimānādhyāya. Copied on Friday 10 October 1690. Formerly property of Jagannātha Samrāt; purchased by Viśveśvara, the son of Rāmeśvara (of the Puṇḍarīka family).

Colophon on f. 38v: iti śrībrahmārṣivṛddhavasīṣṭhapraṇīte || gaṇitaskandha-viśvaparakāśe bhīmānādhyāyaḥ || || 15 ||

Post-colophon: saṃvat 1747 mitī kārttikakṛṣṇa 2 śukre taddine vasiṣṭha-siddhāntapustakaṃ samāptaṃ.

Ownership notes on f. 38v: idaṃ pustakaṃ śrīsamrātjī jagamnnāthasya; on f. 1: idaṃ pustakaṃ śrīgajamnnātha sammrātjīkasya; and: pustakaṃjī || tatsakāśān mūlyena grhītaṃ

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
vasīṣṭhasiddhāntapustakaṃ jagaj jānātu sarvadā || 1 ||

The **VYĀSASIDDHĀNTA** said to be the *Vedāṅgajyotiḥśāstra* in a *Vyā-sasmṛti*. *CESS* A5, 754a–754b. Edited by Radhavallabh Jyotiṣatīrtha, Calcutta [N. D.]. The first verse is:

bhavaṃ nārāyaṇaṃ sāksāt praṇipatya kṛtāñjaliḥ |  
bhaktyā paramayābhyarcya papracchedam ṛṣis tadā ||

Manuscript:

37. Khasmohor 5257. Ff. 1–12. 11.5 × 27 cm. 12 lines.

Colophon on f. 12v: iti śrīvyāsakṛtau dharmasāstre vyāśasmṛtau vedāṅ-gajyotiḥśāstre golapratipādanaṃ samāptaṃ || || śloka 275 iti vyāśasiddhāntaḥ samāptaḥ.

The **SOMASIDDHĀNTA** in the form of a dialogue between Śaunaka and Soma. *CESS* A6. Edited by V. Dvivedin as part 1 of fascicle 1 of his *Jyautiṣasiddhāntasaṅgraha*, Benares 1912. The first verse is:

brhaspatisutaṃ śāntaṃ sukhāsinaṃ priyekṣaṇaṃ |  
abhivandyaṃ munir dhīmān śaunakaḥ paripṛcchati ||

Manuscripts:

38. Museum 47. Ff. 1–19. 8 × 28.5 cm. 6 lines. Copied on ca. 6 March 1679.

Colophon on f. 19v: iti śrīsomasiddhānte caturtho golādhyāyo daśamaḥ || 10 || samāptim agamad ayaṃ grāṃthaḥ || || samāpta.

Post-colophon: saṃvat 1736 śamae caita sudi 5 pañcami.

39. Puṇḍarīka jyotiṣa 3. Ff. 1–18. 11 × 23.5 cm. 10 lines. Copied on Sunday 13 October 1723. Formerly property of Jagannātha Samrāt; purchased by Viśveśvara, the son of Rāmeśvara (of the Puṇḍarīka family).

Colophon on f. 18: iti śrīsomasiddhānte caturtho golādhyāyo daśamaḥ || || samāptim agamad ayaṃ grāṃthaḥ.

Post-colophon: saṃvat 1780 mitī kārttikakṛṣṇa 10 ravivāre taddine samāptaḥ.

Ownership notes on f. 18: idaṃ pustakaṃ śrījagannāthasamrātjīkasya; and on f. 1: idaṃ pustakaṃ śrīsamrātjagannāthasya; and:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
jagaj jānātv idaṃ pustakaṃ || || golādhyāyasya sarvada || 1 ||;



then, below śrīsamrātjagannāthasya: tatsakāśāt maulyena gṛhītaṃ.  
f. 18v. Blank.

40. Khasmohor 1620 Ff. 1–17. 13.5 × 34.5 cm. 9 lines. With some marginalia; some corrections in pencil.

Colophon on f. 17: iti śrīsomāsiddhāṃte caturtho golādhyāyo daśamaḥ 10.

The **SUNDARASIDDHĀNTA** composed by Jñānarāja at Pārthapura in 1503. CESS A3, 75a–76b; A4, 100a; and A5, 122b–123a. The first verse of the grahagaṇitādhyāya is:

diṇmātaṅgasutunṅgapañcavadanaṃ viśvaikalambodaraṃ  
cūḍāratnasahasrabhūdharamahāhāraṃ sunīlāmbaram |  
svāntadvāntaharaṃ kalānidhidharaṃ koṭiniruksundaraṃ  
vārāhopamavāhanaṃ gaṇapatiṃ vande paraṃ śaṅkaram ||

The first verse of the golādhyāya is:

bhāle yasya kalānidhir madhumiladbhṛṅgāvaligaṇḍayoḥ  
kaṇṭhe 'hir vilasatpalaṃ padayuge gīrvāṇacetogūṇaḥ |  
brahmāpi trijagat sīrṣkṣur alaṃ nirvighnasamsiddhaye  
śrīmanmaṅgalamūrttim ādyam alayaṃ taṃ naumi bhaktapriyam ||

Manuscript:

41. Khasmohor 5591. Ff. 1–63. 12 × 26 cm. 8 lines. Golādhyāya (incomplete) on ff. 1v–32, grahagaṇitādhyāya on ff. 32–63. Copied by Tulārāma for Mahārājādhirāja Jayasiṃha on Tuesday 5 November 1706.

F. 11 ends, in the middle of line 1, in golādhyāya, bhuvanakośa 77c: sāmu-  
jyatāṃ bhagavato.

The rest of f. 11 and ff. 11v–12. Blank.

F. 12v begins in golādhyāya, madhyabhuktivāsanā 9d: yojyaṃ tadbhramaṇaṃ.

Colophon on f. 32: eṣa golādhyāyaḥ.

Final verse on f. 63:

itthaṃ śrīmannāganāthātmaṇa  
prokte tantre jñānarājena raṃye ||  
granthāgārādhārābhūte prabhūte  
śṛṅgonnatyādhyāya evaṃ niruktaḥ ||

“Post-colophon” (there is no final colophon): saṃ 1763 varṣe kārttikaśukla  
11 bhaume || || śrīmanmahārājādhirājaśrījayasiṃhadevajīkasyājñayā (sundara-  
siddhāntanāmā graṃtho) lekhi | tulārāmeṇa.

After this is written:

akṣaramātrapadasvarahīnaṃ  
 vyamjanasaṃdhivivarjitarephaṃ ||  
 sādhubhir eva mama kṣamitavyaṃ  
 ko (')tra na muhyati śāstrasamudre || 1 ||

F. 63fv. Blank.

Price on f. 1: kī || ≡.

The **SIDDHĀNTATATTVAVIVEKA** composed by Kamalākara at Kāśī-  
 in 1658. *CESS* A2, 21a–22b; A3, 18a; A4, 33a–33b; and A5, 22a. Edited by S.  
 Dvivedin and M. Jhā, reprinted Vārāṇasī 1991. The first verse is:

brahmāṇḍodaramadhyagāvanijalāgnyūrdhvendupūrvagraha-  
 rkṣordhvasthapravahāntagolaracanā sṛṣṭir yathāvat sthitā |  
 kāle 'smin gahane 'vyaye 'sti satataṃ yasmād iyaṃ taj jayaty  
 ādyaṃ nirguṇaṃ īśaṃ avyayaparabrahmaikatattvaṃ śubhaṃ ||

Manuscripts:

42. Khasmohor 5301. Ff. 1–26. 11.5 × 26.5 cm. 10 lines. Incomplete (ends  
 with madhyamādhikāra).

Colophon on f. 26v: iti śrīkamalākaraviracite siddhāntatattvaviveke madh-  
 yamādhikāraḥ || || 1 ||

Price on f. 1: kī ||j.

43. Khasmohor 5303. Ff. 1–72. 12 × 29 cm. 8 lines. Spaces left blank for  
 diagrams that were never drawn. Incomplete.

F. 72v ends in a prose passage that seems to be connected to the long section  
 of the spaṣṭādhikāra devoted to Sines: atha pañcamāṃśājñena ca pañcaguṇi-  
 tabhujāṃśānāṃ jyāsvārūpa...bhujajyāvargonaś trijyāvargaḥ koṭijyāvarga iti (cf.  
 spaṣṭādhikāra 56 on. p. 108) ...atra pañcamāṃśārūpakevalabhujajyājñānārtham  
 idaṃ jñātajyāsamam iti...pañcaguṇitena trijyāvargavarge (here it ends).

Price on f. 1: kīmatī|| ≡ ||S.

The **SŪRYASIDDHĀNTASĀRAVICĀRA**, a treatise on planetary mod-  
 els and spherical trigonometry based on the *Sūryasiddhānta*, composed, it is  
 alleged, by Samrāt Jayasiṃha, presumably at Amber in ca. 1715–1720. This  
 is attributed hesitatingly to Jagannātha Samrāt in *CESS* A5, 114a. The Jaya-  
 pura manuscript begins, after the salutation: atha spaṣṭādhikāre tripraśnādaḥ  
 ca sūryasiddhānte kiṃcid yathāmati vicāryate. In the upper margin of f. 1v  
 are written by a second scribe two verses:

ānaṃdavallikāṇḍaṃ kāṇḍadyutiṃḍamaṇḍiram amaṇḍam ||  
 raghunaṇḍanam aṇṭar ahaṇ vaṇḍe vaṇḍārumaṇḍāram || (|| 1 ||)  
 śrīmadbhiḥ samrāḍbhir jayasīṇḥaṇṇpāgraṇībhir atigūḍhaṇ ||  
 spaṣṭādhikṛtau spaṣṭaṇ vivecyate golavijñājanatuṣṭyai || 2 ||

These are the first two verses of the *Sūryasiddhāntasāravicāra* in its only other identified copy, RORI 29498. On f. 1 of the Jaipur manuscript the same scribe who copied these two verses of f. 1v has written: *sūryasiddhāntasāravicāraḥ śrīmahārājakṛtaḥ*. Moreover, the words *śrīmadbhiḥ samrāḍbhir jayasīṇḥaṇṇpāgraṇībhir ullikhitā* occur within the text (f. 22 of the Jaipur manuscript).

#### Manuscript:

44. Khasmohor 4955. Ff. A-B, 1-8, C-D, 9-19, 19b, 20-26, 27/28, 29-56, 56b, 57-73, E-F, 74-79, and G. 12 x 29 cm. 7-9 lines. With marginal notes. A number of diagrams have been added to the manuscript, but their relation to the text remains obscure. They were drawn and lettered by the scribe who added the two verses on f. 1v and who was responsible for the marginal notes.

F. A. Blank.

Ff. Av-B. Diagram of a planetary model in which the manda epicycle produces an eccentric circle to act as the deferent of the center of the *śīghra* epicycle.

F. Bv. Blank.

F. C. Blank.

Ff. Cv-D show a model in which the center of the manda epicycle travels on a deferent whose center is carried on the circumference of a small circle whose center is the earth; this is similar to the Ptolemaic crank-mechanism of the Moon save that the center of the deferent and the center of the manda epicycle rotate in the same direction. The center of the *śīghra* epicycle rotates on the circumference of the manda epicycle.

F. Dv. Blank.

F. 19b has a diagram for the Sun with a manda epicycle whose center rotates on a concentric deferent while the center of a secondary (labeled *śīghra*) epicycle rotates on the circumference of the manda epicycle.

F. 19bv. Blank.

F. 41v has an unclear diagram referring to the mandakarnas of the Sun and the Moon.

F. 45v has an unclear diagram relating to the mandakarnas of the superior planets.

F. 51v has two diagrams: one relates to deflection (*valana*), and the other to the mandakarnas of the Sun and the Moon.

F. 56b has a diagram illustrating retrogression according to a geocentric model.

F. 56bv. Blank.

F. 64v. Blank.



F. 73v has two diagrams illustrating an eccentric circle.

F. E has two diagrams relating to planetary and lunar latitude respectively.

F. Ev has a diagram showing the two epicycles of which the larger has no deferent.

F. F has a diagram showing the equivalence of a manda epicycle and an eccentric deferent.

F. Fv has a diagram of a model for the two inferior planets in which the center of the manda epicycle rotates on the circumference of a concentric deferent and the center of the śighra epicycle on the circumference of the manda epicycle.

F. 79v ends, ■ third of the way through line 7: yad vā svalpāṇṭaratvād rad raviṇā sūkṣmāṇṇād ata iti dik.

There is no colophon.

F. G. Blank.

Price on f. 1 and f. Gv: kī 3j.

The earliest version of the **SIDDHĀNTAKAUSTUBHA** composed by Jagannātha Samrāṭ at Amber in about 1727. Some of the manuscripts listed in *CESS* A3, 57a–58a, and A5, 114a, undoubtedly contain the *Siddhāntakaustubha* instead of or as well as the *Samrāṭsiddhānta* that is a translation of Ptolemy; among these are RORI 17213, 19747, and 36323. A second version of this text was edited by M. Caturveda, *Sāgara* 1976 (it mentions 1730); and a third by R. Śarman, *Samrāṭsiddhānta*, vol. 2, Nāi Dillī 1967, pp. 1029–1213 (it mentions 1732). The opening verses of the earliest version are:

gaṇādhipaṃ surārcitaṃ samastakāmadam nṛṇām |  
 praśastabhūtibhūṣitaṃ smarāmi vighnavāraṇam || 1 ||  
 lakṣmīṇṣiṃhacaraṇāmburuhaṃ sureśair  
 vandyam samastajanasevitareṇugandham |  
 vāgdevatāṃ nikhilamohatamopahantrīm  
 vande guruṃ gaṇitaśāstraviśāradaṃ ca || 2 ||  
 śrīgovīndasamāhvayādivibudhān vṛndātavīnirgatān  
 yas tatraiva nirākulaṃ śucimanobhāvaḥ svabhaktyānayat |  
 mlecchān mānasamunnatān svatarasā nirjitya bhūmaṇḍale  
 jīyāc chrījayasiṃhadevanṛpatiḥ śrīrājarājeśvaraḥ || 3 ||  
 karaṃ janārdanaṃ nāma dūrikṛtya svatejasā |  
 bhrājate duḥsaho rīṇāṃ yathā graiṣmo divākaraḥ || 4 ||  
 yeneṣṭam vājapeyādyair mahādānāni ṣoḍaśa |  
 dattāni dvijavaryebhyo gogrāmagajavājīnaḥ || 5 ||  
 tena śrījayasiṃhena prārthitaḥ śāstrasamvidā |  
 karoti śrījagannāthaḥ samrāṭ siddhāntakaustubham || 6 ||  
 kṛtī jayati bhāskaro gaṇitagolātattvārthavin  
 munīśvara udāradhīḥ prathitatantrasadvāsanah |  
 jayanti kamalākarādaya udārasadyuktayah  
 kṛtī bhavati mādrśaḥ samavalokya yeṣāṃ kṛtīḥ || 7 ||

**Manuscript:**

45. Puṇḍarīka jyotiṣa 5. Ff. 1–38. 11 × 22 cm. 9–12 lines. With some marginalia. Incomplete.

F. 38v ends, in the middle of line 8, with verse 60 of a section entitled akṣakṣetrāṇi:

chāyādvayaṃ caikakapāla eva  
tadā bhavet kālavibhedasiddham |  
aśodhitākṣāṇśavaśāt tathātra  
prabhā bhaved yāmyadig aṃśakeṣu || 60 ||

## C. KARAṆAS

The karaṇa version of the **RĀJAMṚGĀṆKA** composed by Bhojadeva (Bhojarāja) at Dhārā in 1042. *CESS* A4, 337a, and A5, 266b, where the koṣṭhaka version is included. Edited by D. Pingree in *Aligarh Oriental Series* 7, Aligarh 1987, pp. 4–42.

The first verse is:

arkaś candraḥ kujah saumyo jīvaḥ śukraḥ śanis tamaḥ |  
ketur grahā navāpy ete pāntu vo duritacchidaḥ ||

Manuscript:

46. Khasmohor 5589. Ff. 1–22. 12 × 27 cm. 10–12 lines. With some marginal notes. Copied for his own use by Śrīdatta Jyotirvit, the son of Śāṅkara, the son of Puruṣottama Vyāsa, a resident of Jodhapura, on Thursday 25 June 1618. The text differs considerably from the edition.

Edition	Khasmohor 5589
madhyama 22 verses	madhyamānayana 57 verses
spṣṭīkaraṇa 68 verses	sphuṭagati 223 verses
tripraśna 57 verses	tripraśna 43 verses
udayāsta 100 verses	candragrahaṇa 18 1/2 verses
śṛṅgonnati 11 verses	sūryagrahaṇa 11 verses
candragrahaṇa 65 verses	udayāsta 14 verses
sūryagrahaṇa 56 verses	grahayuti 24 verses
grahayuti 91 verses	śṛṅgonnati 27 verses

Colophon on f. 22v: iti śrīmahārājādhirājaparmeśvarasakalavilāsinījīvite-śvaraśrībhojadevaviracite

śrīrājamṛgāṅkanāmni karaṇe śṛṅgonnatyadhikāro 'ṣṭamaḥ saṃpūrṇaḥ || sam-āptaṃ rājamṛgāṅkakaraṇam iti.

Post-colophon: saṃvat 1675 varṣe śāke 1540 āśāḍhasudī 13 gurau vyā° puruṣottamasutasamkaratatputrajyotirvit śrīdattena likhitam idaṃ ātmapaṭha-nārthaṃ || (|| jodhapuranayare vāstavyaṃ ||).

Price on f. 1: kī ≡.

The **KARAṆAPRAKĀŚA** composed by Brahmadeva at Mathurā in 1092. *CESS* A4, 257b–258b, and A5, 240a–240b. Edited by S. Dvivedin as *CSS* 23, Benares 1899. The first verse is:

brahmācyutatrinayanārkaśaśāṅkabhauma-  
saumyejyaśukraśanivāgadhīpāgaṇeśān |



natvāham āryabhaṭasāstrasamaṃ karomi  
śrībrahmadevagaṇakaḥ karaṇaprakāśam ||

**Manuscripts:**

47. Khasmohor 4953. Ff. 1–13. 11 × 24 cm. 9/10 lines. Copied by the son of Keśava on a Friday in 1626/7.

Colophon on f. 13v: iti śrībrahmadevaviracite karaṇaprakāśe grahayutyadhikāraḥ samāptaḥ.

**Post-colophon:**

aṣṭasāgaraśīlīmukhaśrubhiḥ 1548  
saṃmite śakavare bhṛguvāre  
keśavasya tanayaḥ paripūrṇaṃ  
brahmadevakaraṇaṃ samakārsīt

**After this is written:**

ālolaṭulaśīmālam ārūḍhavinatīsutam ||  
jyotirīṇḍīvaraśyāmam āvir astu mamāgrataḥ ||

48. Puṇḍarīka jyotiṣa 33. Ff. 1–12. 11 × 24 cm. 9/10 lines. A careful copy of manuscript 47, including its colophon, post-colophon, and additional verse. Formerly property of Viśveśvara, the son of Rāmeśvara Puṇḍarīka.

Colophon on f. 12v: iti śrībrahmadevaviracite karaṇaprakāśe grahayuddhādihikāraḥ samāptaḥ.

**Post-colophon:**

aṣṭasāgaraśīlīmukhaśrubhiḥ 1548  
saṃmite śakavare bhṛguvāre  
keśavasya tanayaḥ paripūrṇaṃ  
brahmadevakaraṇaṃ samakārsīt

**After this is written:**

ālolaṭulasīmālam ārūḍhavinatīsutam ||  
jyotirīṇḍīvaraśyāmam āvir astu mamāgrataḥ ||

**Ownership verse on f. 1:**

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
karaṇaprakāśapustam jagaj jñātu sarvadā || 1 ||

The **BHĀSVATĪ** composed by Śatānanda at Puruṣottama in 1099. *CESS* A6. Edited by R. Miśra as *KSS* 46, 2nd ed., Vārāṇasī 1985. The first verse is:

natvā murāreś caraṇāravindaṃ  
śrīmāñ śatānanda iti prasiddhaḥ |  
tām bhāsvatīm śiṣyahitārthaṃ āha  
śāke vihīne śaśipakṣakhaikāḥ ||

#### Manuscripts:

49. Khasmohor 5408. Ff. 1–8. 11.5 × 23 cm. 10 lines. Ff. 1–2 and 7–8 are double folios. Folios much damaged. With extensive marginalia. Copied in 1606/7.

Colophon on f. 8: iti śrīpañcasiddhāntasame bhāsvatīkaraṇe parilekhādhikāro ṣṭamaḥ

Post-colophon: saṃvat 1663.

Price on f. 1: kī = |S.

50. Khasmohor 5358. Ff. 1–10. 11 × 25 cm. 17 lines. With an udāharaṇa. Incomplete (adhikāra 8 omitted). Copied on ca. 23 October 1699.

Colophon on f. 10v: iti śatānamdaviracite bhāsvatīkaraṇe sūryagrahaṇādhi-  
kārah | samāptitaṃ bhāsvatīkaraṇaṃ sodāharaṇaṃ idaṃ.

Post-colophon: saṃvat 1756 kārttikasudī 10.

51. Khasmohor 5572. Ff. 1–2 and 4–9. 11 × 12 cm. 13/14 lines. With marginalia. Incomplete. Copied for himself by Dhanarāja, the son of Vidyāvinoda Mathena, on Saturday 17 May 1701.

F. 2v ends in 2, 3a (p. 13, 2): abdaḥ prthak kheśa 110 guṇaḥ.

F. 4 begins in 3, 2d (numbered 3 in manuscript)(p. 33, 8): rgaṇa māṃśakaḥ  
saṃyutaḥ syāt 3.

Colophon on f. 9v: iti śrībhāsvatyām parileśādhikārāṣṭamaḥ samāpta || iti  
śrīaurapakṣe bhāsvatīgrantha samāpta.

Post-colophon: saṃvat 1758 varṣa jyēṣṭhavadī 6 ravisute mathenavidyāvinoda  
tatputra dhanarājene likhitaṃ svavācanārthaṃ.

After this is written: graṃthāgrantha śloka 115.

52. Khasmohor 5195. Ff. 1–12. 11.5 × 26.5 cm. 8 lines. Copied by Tulārāma at Amadāvāda (Ahmadābād) for Mahārājādhirāja Jayasiṃha on Sunday 8 December 1706.

Colophon on f. 12: iti bhāsvatīkaraṇe parilekhādhyāyaḥ samāptaḥ.

Post-colophon on f. 12v: saṃ 1763 varṣe mārgaśīrṣaśukla 15 ravau śrī-  
manmahārājādhirājajīśrījayaśiṃhadevajīkasyājñayā likhitaṃ idaṃ tulārāmeṇa

|| || mukāma amadāvādamadhye.

Price on f. 1: kī ||.

53. Museum 176. Ff. 1–8. 9.5 × 25 cm. 10 lines. With many marginalia. Copied by Rāmadatta Rāma in 1791/2.

Colophon on f. 8: iti śrīśatānaṁdaviracite bhāsvatīkarāṇe parilekhādhikāraḥ.

Post-colophon: samva 1848 rāmadatarāmena likhite.

This is followed by:

karko 'gne yama nairte ca vāyudiśā jñāyate kathitaṁ  
 īśānottaradik tathā ca kāryaṁ taṁ tūrye diśā tūryabhuk  
 ity etat kathitaṁ varāhamihire rudre tathā yāmale  
 saṁdehasya vināśanāya bhavitā rudroktapriyā cāgvataḥ(?) || 1 ||

54. Khasmohor 5305. Ff. 1–35. 10/11 × 24.5 cm. 7 lines. With corrections and marginal notes by a second scribe. With an udāharaṇa. Incomplete (adhikāra 8 omitted).

Colophon on f. 35: iti bhāsvatīkarāṇe sūryagrahaṇādikāra samāpto yam iti.

Price on f. 1: kī | = |||S.

**A BHĀSVATYUDĀHARAṆA**, an anonymous commentary on Śatānanda's *Bhāsvatī*. It begins: tatrādaṁ sakalavighnopaśamanārtham iṣṭadevatāna-maskārapūrvaṁ sambandhādhikam āha. It continues after verse 1: asyānvayaḥ || śrīmān śatānanda iti prasiddhaḥ tāṁ bhāsvatīm āha.

See manuscripts 50 and 54.

The **KARĀṆAKUTŪHALA** composed by Bhāskara at Vijjaḍaviḍa in 1183. *CESS* A4, 322a–326a, and A5, 261b–263a. Edited with the ṭikā of Sumatihaṛṣa by S. Miśra, Vārāṇasī 1991. The first verse is:

gaṇeśaṁ giraṁ padmajanmācyuteśān  
 grahān bhāskaro bhāskarādīṁś ca natvā |  
 laghuprakriyaṁ prasphuṭaṁ khetakarma  
 pravakṣyāmy ahaṁ brahmasiddhāntatulyam ||

Manuscripts:

55. Khasmohor 5057. Ff. 1–8. 11.5 × 27 cm. 11–13 lines. With marginalia. Copied by Pāṇḍai(?) on ca. 10 May 1572.

F. 8 ends with 11, 6d (p. 121, 4): kuśamaṇyuli arghayaḥ.

Colophon on f. 8: iti abhrānayaṇa samāptaḥ.

Post-colophon: saṁ 1629 jethavadi 13 li° pāṇḍai.



Below this is written the table of bhogas 1 to 4 of the Sun from Bhojadeva's *Rājamṛgāṅka*. The entries are for the epoch (10<sup>s</sup> 28; 45, 0°); 1, 2, 3...9 days; 10, 20, 30...90 days; 100, 200, 300...900 days; and 1000, 2000, 3000...9000 days. The heading is: *rājamṛgāṅke ravibhogā likhyante*.

56. Khasmohor 5203. Ff. 1–25. 11.5 × 20 cm. 8 lines. Incomplete (adhyāya 11 missing). Copied by Līlādhara near the Mahākāleśvara temple in Avantikā (Ujjayinī) on Tuesday 18 August 1705 during the reign of Mahārāja Jayasimha.

Colophon on f. 24: *iti śrīpaṇḍitabhāskaravīracite brahmasiddhāntatulye karnakautūhale daśamadhikāra grahaṇasaṃbhavaṃ samāptaṃ || śrī || samāpta graṃtha*.

After this is written:

gataiṣyanādīgunitā<sup>a</sup> khakhāṣṭaiḥ<sup>b</sup> 800  
sarvarkṣanādīvihrtā<sup>c</sup> kalādyā[h] |  
bhuktarkṣayu(ktāḥ)<sup>d</sup> sakalā grahāś ca  
ṣaṣṭyāhate ṣaṣṭiśateṣu(?) bhukti(h) || 1 ||

a. °nādīgunitā. b. khakhāṣṭau. c. sarvarkṣanādīvihrtā. d. bhuktirkṣayu.

After this is another colophon: *brahmatulyamūla saṃpūrṇaṃ*.

Post-colophon: *saṃvat 1762 varṣe bhādrapadaśuklapakṣe 10 maṇḍavāsare li<sup>o</sup> līlādhareṇa || śubham astu | avantikāmadhye mahākāleśvarakṣiprāsannidhau idaṃ pustakaṃ ||*

yādṛśaṃ pustakaṃ dṛṣṭvā tādṛśaṃ likhitaṃ mayā ||  
yadi śuddham aśuddham vā mama doṣo na dīyate || 2 ||  
tailād rakṣe jalād rakṣed rakṣe śrathilabaṇḍhanāt |  
mūrṣahaste na dātavyaṃ evaṃ vadati śārada || 2 ||

*mahārājaśrī | jayasimhajīvijayarājye*.

57. Khasmohor 5356. Ff. 1–7. 11.5 × 26 cm. 14 lines. Incomplete (adhyāya 11 omitted). Copied on ca. 30 March 1711.

F. 7v ends with 10, 10a–c (p. 119, 6–7):

itiha bhāskarodite grahāgame kutūhale  
vidagdhābuddhivallabhe

Colophon on f. 7v: *iti śrībrahmatulye pātasāṃbhavādhikāro daśama | 10 ||*.

Post-colophon: *saṃvat 1768 varṣe vaiśākhavadi 8 dine likhitaṃ*.

58. Khasmohor 5583. Ff. 1–20. 11.5 × 27 cm. 7 lines. With extensive marginalia by a second scribe. Incomplete (adhyāya 11 omitted). Copied by

Tejabhāna on Tuesday 10 February 1756. Formerly property of Tejabhāna, the son of Gulābrāya.

After the colophon to adhyāya 10 is written on f. 20:

gaṇodhas(?) triyuk svākṣigogāṅgayukta692s  
triṣaṭṭ3bhakta āptāvamair yukta ūrddhaḥ  
kharāmai30r hataḥ saikaśeṣaṁ tithiḥ syāt  
phalaṁ māsavṛd(?) aṁtato dho dvinighnāt 1  
rasāṅgānvitāt sve bhanetrāṁka928labdhā  
vihinā dagāṅgā(?) 66 bhānona(?) ūrddhaḥ  
hato bhānubhiḥ 12 śeṣakaṁ yātamāsā  
gatābdā phalaṁ śeṣukheṣaṁ 1105 śakas tat 2

Colophon: iti śrībhāskarācāryakṛte brahmatulyakaraṇam.

Post-colophon:

dvyekāṣṭhendumite varṣe māghe ṁtakatithau sudi  
kuje mayedaṁ likhitam tejabhānena pustakaṁ |

sambāt 1812 śakaḥ 1677 māghasudi 10 bhaume.

Ownership note on f. 1:

śrīmadgulābrāyasya tejabhāno stai puttrakaḥ  
tasyedaṁ pustakaṁ jñeyam khanetramitapattrakam.

59. Khasmohor 5427. Ff. 1–13. 11 × 26 cm. 9/10 lines. Copied on Monday 21 August 1769.

Colophon on f. 13v: iti śrībrahmasiddhāṁtatulye bhāskariye karṇakutūhale parvānayanādhikāro daśamaḥ 10.

Post-colophon: samvat 1826 bhādre kṛṣṇe 4 caṁdre li°.

After this is written adhyāya 11, ending with 11, 6d (p. 121, 4): kusumāṁ-jalīnarcayet.

60. Puṇḍarīka jyotiṣa 40. Ff. A and 1–10. 9.5 × 24.5 cm. 11 lines. Incomplete (adhyāya 11 omitted). Copied by Gopīnātha, the son of Rāmeśvara Vyasa, on Friday 31 October 1788. Formerly property of Viśveśvara, the son of Rāmeśvara Puṇḍarīka.

Ff. Av–1r. Blank.

Colophon on f. 10v, after 10, 4 (p. 119, 5): iti karṇakutūhalaṁ samāptaṁ.

Post-colophon: likhitam vyasopanāmakarāmeśvarasyātmajagopīnāthena || || śubham bhavatu || || samvat 1845 kṛttika śukra 2 bhṛgau.

Ownership note on f. A:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
jñeyam niraṁtaram sadbhīr brahmatulyasya pustakaṁ || 1 ||

61. Khasmohor 5144. Ff. 1–30, 29 (corrected to 31), 31b, 31c (renumbered 32), 32b–45, 45b (corrected to 46), and 47–64. 13 × 24 cm. 10 lines. With the *ṭikā* of Padmanābha. Incomplete.

F. 64v ends, in the middle of line 8, in the *ṭikā* on 5, 8 (p. 69, 20–21): *evaṃ yaśi sakṛt kṛte laṃbanave*.

Price on f. 1: *kīmatī* ¶¶–.

62. Khasmohor 5175(b). 1 f. 11.5 × 28.5 cm. 9 lines. Incomplete (excerpts).

F. 1r. *pañcayugābdhi445hīne śake śaṣṭyā 60 hr̥te ayanāṃśāḥ | 1 | karṇa-kautūhale ||* There follow *Karaṇakutūhala* 1, 2–3 (p. 2, 16. *śaka* to 19. *yam* ||); 1, 4d (p. 4, 24. *navā9tyaṣṭi* to *caṃdrapāte* ||); and 1, 9c–d (p. 9, 13. *dvidhāṃkacaṃdrai* to *bhavatīṃdupātaḥ* ||).

F. 1v begins in 3, 1a (p. 35, 3): *laṃkodayā*.

F. 1v ends in 3, 7d (p. 38, 18): *conataṃ yā*.

63. Khasmohor 5406. Ff. 1–43 (f. 8r blank; no text lost). Copied by two scribes:  $\alpha$  ff. 1v–19v and  $\beta$  ff. 20r–43v. Dimensions not recorded.  $\alpha$  8–12 lines, and  $\beta$  10 lines. With an anonymous *vivṛti*. Incomplete.

$\alpha$  f. 19v ends in the *ṭikā* on 3, 2c–4d (p. 35, 6–10): *lagnabhuktakālāna(yana)..*

$\beta$  f. 20 begins in the *ṭikā* on 3, 5 (p. 36, 29–30): *yor yogaḥ 300 madhyodayābhāvād ayam eveṣṭakālo lagnāj jātaḥ*.

$\beta$  f. 43v ends in the *ṭikā* on 9, 1a–2b (p. 103, 3–5): *samāpamatve ravicaṃdrayoḥ kṛāntisāmye sati tadaikye*.

Price on f. 1: *kī* ||| · |||S.

The **NĀRMADĪ**, a commentary on Bhāskara's *Karaṇakutūhala* composed by Padmanābha in ca. 1400. *CESS* A4, 170a–170b, and A5, 205b. The first verse is:

jñātum saduktilavayugvivṛtiṃ tu śiṣyaiḥ  
saṃprārthito 'lpavid api pratipadyaḥ sūktim |  
śrībhāskaroditapitāmahaṭulyakarma-  
vṛttiṃ vidhātum amalām aham udyato 'smi ||

See manuscript 61.

An anonymous *vivṛti* on Bhāskara's *Karaṇakutūhala* which mentions Śaka 1464 and 1466 = A.D. 1542 and 1544. The first verse is:

śaṅkaracaraṇasarojaṃ  
praṇamya bhaktyā yathāmati mayeyam |  
karaṇakutūhalavivṛttir  
vidhīyate bālabodhāya ||



See manuscript 62.

The **BRAHMATULYODĀHARAṆA**, a commentary on Bhāskara's *Kaṛaṇakutūhala* composed by Viśvanātha in part in 1612 at Kāśī, though there are examples dated as late as 1644 in at least some manuscripts. *CESS* A5, 669a–669b. The first verse is:

praṇamya vaghnahartāraṃ mandabodhāya samprati |  
brahmatulyasya gaṇitodāhṛtiṃ prakaronmy aham ||

Manuscripts:

64. Khasmohor 5580. Ff. 1–34. 11 × 27 cm. 11 lines. With some marginal notes. Lemmata only from the mūla. Incomplete.

F. 34v ends in the ṭīkā on 5, 6–7 (p. 68, 26–29): tātkaḷikaś caṃdraḥ 8|5|17|8| pātaḥ 9|18|46|52| sapātaṃdraḥ 5|24|4|0 aṃgulādyah.

65. Puṇḍarīka jyotiṣa 39. Ff. A and 1–21, (22), and 23–77. 9.5 × 25 cm. 7 lines. Lemmata only from mūla. Incomplete. Formerly property of Viśveśvara, the son of Rāmeśvara Puṇḍarīka.

Ff. Av–1r. Blank.

Colophon of adhyāya 9 (p. 114) on f. 77: iti śrīdivākaradaivajñātmajaviśva-nāthadaivajñaviracite

brahmatulyasyodāharaṇe pātādhikārasyodāharaṇaṃ.

After this is written: śrīviśvanāthena divākarasya sutena kāśyāṃ racitā samāptā gobhidhagrāmanivāśineyam udāhṛtiḥ khetakutūhalasya vedāgnitithy-ul534nmitaśāke saṃvatsare durmatināmadheye pauṣe site rudratithau jñavāre samāptim āgad gaṇitaṃ samastaṃ.

Ownership note on f. A:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
brahmatulyodāharaṇapustakaṃ varttate tv idam || 1 ||

The **GAṆAKAKUMUDAKAUMUDĪ**, a commentary on Bhāskara's *Kaṛaṇakutūhala* composed by Sumatiharṣa Gaṇi at Nikaṣāpurī in the Vindhyādri in ca. 1620. *CESS* A6. Edited by Satyendra Miśra, Vārāṇasī 1991. The first verse in the manuscripts, but not in the edition, is:

śambhuṃ svayambhuvam ahaṃ praṇipatya pūrvam  
nābhyudvahaṃ vigatakarmarajovitānam |  
śvo(?) dharmabhūruhadhano dhṛtavān subhavyaḥ  
kṣetre 'tra bodhivapanāya maho 'kṣalakṣma ||

## Manuscripts:

66. Khasmohor 5576. Ff. 1–56. 11 × 26 cm. 12 lines. With some marginalia. Incomplete (adhyāya 11 omitted). Copied on Friday 25 March 1737.

Colophon on f. 56v: ity āṃcalikamahopādhyāyaśrīudayarājagaṇinām śiṣyo-  
pādhyāyaśrīharsaratnagaṇinām śiṣyapaṇḍitaśrīsumatīharsagaṇiviracitāyām ka-  
raṇakutūhalavṛttau gaṇakakumudakaumudīnāmnyām grahaṇasaṃbhavādhikā-  
ro daśamaḥ || 10 || samāpto yaṃ graṇthaḥ.

Post-colophon: saṃ 1794 varṣe caitrasudī 5 bhṛgau lipīkṛtaṃ.

67. Khasmohor 5429. Ff. 1–77. 10 × 26 cm. 11 lines. Incomplete (adhyāya 11 omitted). Copied on Thursday 7 September 1769. Formerly property of Sūryabhānu.

Colophon on f. 77v: ity āṃcalikamahopādhyāyaśrīudayarājagaṇinām śiṣyo-  
pādhyāyaśrīharsaratnagaṇinām śiṣyapaṇḍitaśrīsumatīharsagaṇiviracitāyām ka-  
raṇakutūhalavṛttau gaṇakakumudakaumudīnāmnyām grahaṇasaṃbhavādhikā-  
ro daśamaḥ || 10 || samāpto yaṃ graṇthaḥ.

Post-colophon: śrīsaṃvat 1826 varṣe bhādrapadamāse śukle pakṣe tithau  
saptamyām gurau lipīkṛtaṃ | lekhakapāṭhakayoḥ śubhaṃ bhūyāt.

Ownership note: sūryabhānusaṃ pustakam idaṃ.

After this is written:

adrṣṭidoṣāt mativibhramā(c) ca  
yad arthihīnaṃ likhitaṃ mayātra  
tat sādhum(u)khyair api sodhaniyaṃ  
kopo na kāryyaḥ khalu lekhakāya || 1 ||

68. Khasmohor 5055. Ff. 1–23, 23b, and 24–29. 11 × 25.5 cm. 17–19 lines. Usually only lemmata from the mūla. Incomplete.

F. 29v ends in the ṭikā on 8, 4–6 (p. 98, 8): ubhayor mārgragrahayor madhye  
yo maṃ.

69. Khasmohor 5255. Ff. 1–7. 10.5 × 21.5 cm. 12–15 lines. Incomplete (adhyāya 9).

F. 1 begins with the heading and udāharaṇa for adhyāya 9 (cf. p. 103): atha  
pātādhyāyo vyākhyāyate tatrāḍau pātaka lisyate | śake 1539 laukikakāṭivadi 10  
bhaume.

F. 7v ends, in line 10, in the ṭikā on 9, 15 (p. 112, 12): ādikṛtya gamya.

An unknown ṭikā on Bhāskara's *Karaṇakutūhala*.

## Manuscript:

70. Khasmohor 157(a). 1 f. 11 × 25.5 cm. 15 lines. Incomplete (end of adhyāya 4). Lemmata only from the mūla.

Recto begins with the lemma of 4, 21c (p. 61, 15): || mānāṃtarārdhēti |

Recto ends with an abbreviated form of 4, 24 (p. 63, 21–22): iti karaṇaku-  
tūhale | vidagdhabuddhiballabhe | caṃdragrahaṇādhikāro caturthaḥ.

Verso. Blank.

The **SŪRYATULYA** composed by Dāmodara in 1417. *CESS* A3, 101a, and A4, 108a. The first verse is:

siddhiḥ syāt sarvakāmānām udaye 'rthapradānataḥ |  
yasya viśvaikanetrasya tasmai śrībhāskṛte namaḥ ||

Manuscript:

71. Khasmohor 5198. Ff. 1–25. 12 × 26 cm. 9 lines.

Colophon on f. 25v: iti śrīgaṇakacakracūḍāmaṇisakalaśāstraviśārada śrīpad-  
manābhasyātmaajena taccaraṇāraviṃdayugalaprasādāptavidyena śrīdāmoda-  
reṇa viracite sūryatulyābhidhāne karaṇe miśrakādhyaḃyodaśamaḥ samāptaḥ  
samāptam idaṃ sūryatulyābhidham nāma karaṇam.

The **GRAHALĀGHAVA**, also entitled **SIDDHĀNTARAHASYA**, composed by Gaṇeśa at Nandigrāma in 1520. *CESS* A2, 94a–100a; A3, 27b–28a; A4, 72a–74a; and A5, 69b–72b. Edited with the ṭīkāś of Mallāri and Viśvanātha by S. Dvivedin, Bombay 1925. The first verse is:

jyotiḥprabodhajananī pariśodhya cittam  
tatsūktakarmacaraṇair gahanārthapūrṇā |  
svalpākṣarāpi ca tadamaśakṛtair upāyair  
vyaktīkṛtā jayati keśavavāk śrutiś ca ||

Manuscripts:

72. Khasmohor 4951. Ff. 1–31. 9.5 × 22 cm. 7/8 lines. Folia old and torn. With marginal notes. Copied by Vāsudeva for his son at Kāśī on Wednesday 27 January 1647.

Colophon on f. 31: iti grahalāghave paṃcāṃgānayanagrahaṇādhikāraḥ iti  
śrīsakalāgamācāryavaryaśrīkeśavasāṃvatsarātmajagaṇeśadaivajñaviracite | sid-  
dhāntarahasye grahalāghavākhyam samāptam.

Post-colophon: śāke 1568 māghaśudipratipadā budhe pūrṇīkṛtam idaṃ pu-  
stakam vāsudevena kāśyām putrapaṭhanārtham.

73. Khasmohor 5601. ff. A, α 1–16, β 17–30, and 1b (β ff. 17–30 are of a different paper, and f. 1b of a third type of paper). α and β two different



scribes. 11.5 × 27 cm. 7 lines. (f. 1b 11 × 25.5 cm. 9 lines.) Right sides of folia torn. With many marginalia. Incomplete (upasamhārādhikāra omitted). Copied by Harikṛṣṇa on ca. 22 September 1653. Formerly property of Senāpati.

Ff. Av-1r. Blank.

Colophon on f. 30: iti pañcāṅgasiddhiḥ.

After this is written:

samatalamastakaparidhir  
vamisi(d)dho daṁtidam̐tajaḥ śaṁkuḥ |  
ta(c)chāyātaḥ proktaṁ  
jñānaṁ dikdeśakālānām || 1 ||

Post-colophon: harikṛṣṇenālekhi saṁvat 1710 aśvine māsi śukle 10.

F. 30v. Blank.

Ownership note on f. A: pustakaṁ śrīsenāpatinām maulyena gr̥hitaṁ.

F. 1b contains the beginning of a vyākhyā (Raghurāma's? *CESS* A5, 380b-382b) on Raghurāma's or Mahādeva's (*CESS* A4, 379b-381a, and A5, 290a-290b) *Kālanirṇayasiddhānta*.

śrīgaṇeśāya namaḥ ||

praṇamyaikaṛadaṁ devaṁ śāradāṁ gurum eva ca |  
kālanirṇayasiddhāntaṁ vyākurve viśadoktitaḥ || 1 ||  
prājñair ādyair hṛdyapadyair nibaṁdhāḥ  
kl̥ptā nānāvedaśāstrārthavidbhiḥ |  
bhāsvatsv eteṣv arthasaṁdarśanārthaṁ  
dīpākārā me kṛtir durjjarāsmāt || 2 ||  
jānanti ye bhūri subhūrividyā  
teṣāṁ nimittaṁ na mamaīṣa yatnaḥ |  
utpatsyate matsadṛśo pi kaścit  
kālo hy anaṁto vipulā dharitrī || 3 ||

atha graṁthakarttā svābhīṣtaṁ pratijānīte ||

śivaṁ kālatanum natvā vipaścijjanatuṣṭaye |  
kālanirṇayasiddhāntaṁ vakṣye graṁthānusārataḥ || 1 ||

ahaṁ kālanirṇayasiddhāntaṁ vakṣya ity anvayaḥ kālaḥ parāparavyatikara-  
yauḡapadyavirakṣiprapratyayaḥ | teṣāṁ viśayeṣu pūrvapratyayavilakṣaṇā-  
nām utpattāḥ anyanimittasambhavād yad atra nimittaṁ sa kāla iti sarva.

74. Puṇḍarīka jyotiṣa 37. Ff. 1-19. 12 × 27.5 cm. 10 lines. Edges of folia torn. With many marginal notes. Copied on Friday 24 November 1704. Formerly property of Vaijanātha Jo(śi).

F. 19v ends in upasaṃhārādhikāra 3d (p. 367, 18): śako yadi.

Upasaṃharādhikāra 4-5 are written by a second scribe in the upper margin; colophon: (iti svapraśaṃsā).

The first scribe continues:

dvist(h)o (')yam grahalāghavadyunicaya[h]ś cakrāhataih ṣaṭśaraiḥ 56  
 ṣaṭghasrai26ś ca yutaḥ savāṇatapan(aḥ)125 seṣu5ś ca khāṃgāgnibhi360(h {)  
 khājyāśai30r vihrtaḥ phale guṇayama23<sup>a</sup>ghne cakranichrā(?)5kṣakho-  
 pete dvitri32<sup>b</sup>yute nagai7r<sup>c</sup> varitake hastih samāsa(+) pau || 4 ||  
 dvist(h)o 2 dyupinido radabhū132yuto (')rka12yuk  
 khāṃgā360gnihrt khagni30hrtah phale yute ||  
 vedai4r guṇai3s tridvi2(3)hate (')dri7śeṣite  
 (')rkād brahmatulye karaṇe (')bdamāsapau || 5 ||  
 vayo (')bdās tri3taṣṭā daśaghnā gatāyuh  
 samā māsaghasraikyayuktā samābhyah ||  
 dinām15śānvitā janmatithyanvitās te  
 kharāmai[h]30ś ca taṣṭā tithih syād daśādaḥ || 6 ||

a. 3s2. b. 2s3. c. nago7r.

Colophon on f. 19v: samāpto yaṃ grahalāghavaḥ.

Post-colophon: saṃvat 1761 āgrahāyaṇike māse 9 bhṛguvāsare.

Ownership note on f. 1: idaṃ jo. vaijanāthasya grahalāghavapustakaṃ vart-  
 tate.

75. Khasmohor 5319. Ff. (1), 2-13, and (14). 15 × 27 cm. 11-13 lines. With some marginalia. Copied by Santoṣarāma on Thursday 5 July 1705.

Colophon on f. (14): iti śrīnaṃdigrāmasthadaivajñagaṇeśaviracitaṃ sid-  
 dhāntarahasyaṃ grahalāghavaṃ saṃpūrṇaṃ.

Post-colophon: dvirasabhūcamdramite (read: bhūbhṛc<sup>o</sup>) varṣe śrāvaṇe māsi  
 kṛṣṇe pakṣe 11 gurau saṃtoṣarāmeṇa likhitaṃ idaṃ.

Price on f. (1) and f. (14v): kīmati || ≡ ||.

76. Khasmohor 5011. Ff. 1-178. 12 × 26.5 cm. 9 lines. With the ṭikā of Mallāri. Copied by Tulārāma for Mahārāja Jayasimha on Thursday 5 September 1706 from a manuscript copied by Viṭṭhala Dīkṣita in 1625.

Colophon on f. 178: iti śrīmatgaṇakacūḍāmaṇidivākaradaivajñasūtamallāri-  
 daivajñaviracitāyā grahalāghavaṭīkāyāṃ graṃthasamāptyalaṃkāravākhyānaṃ  
 samāptaṃ.

After this follow Mallāri's two final verses (p. 370, 5-12).

Post-colophon on ff. 178-178v:

bāṇonā(c) chakataḥ kurāma31vihrtān mūlaṃ hi māsaḥ sa yuk  
 [f. 178v] bāṇair bhaṃ ca daśonitaṃ dinamitis tasyā dalaṃ syāt  
 tithih (|)

pakṣaḥ syāt tithisaṃmito 'khilayutiḥ saptābdhitithyunmitā  
śrīmadvitthaladīkṣito (')likhad<sup>a</sup> imāṃ ṭikāṃ praṇamyācyutaṃ |

a. khilad.

śrīmahārājādhirājaśrījayaśiṃhajīdevājñayā likhitam idaṃ tulārāmeṇa || miti  
bhādrapadaśuddha 9 gurau.

Price on f. 1: kī ४||=J.

77. Khasmohor 5394. Ff. 1–54. 11 × 22 cm. 6 lines. With marginal notes. Incomplete (upasamhārādhikāra omitted). Copied by Harinārāyaṇa Praśnorā on Friday 22 June 1733.

Colophon on f. 54: iti śrīkeśasāṃvatsarātmajagaṇeśadaivajñaviracite gra-  
halāghavākhye siddhāṃtarahasye pañcāgāyanagrahaṇādhikārah.

Post-colophon: saṃvat 1790 varṣe āsāḍhamāse kṛṣṇapakṣe tithau 8 śukravāre  
liṣitaṃ praśnorā harinārāyaṇena.

78. Khasmohor 5600. Ff. A and 1–50 (ff. 1–2, 37–40, 45–46, and 48–49 different paper and different scribe). 11 × 26.5 cm. 14 lines. With corrections by a different scribe, but not on the folia of different paper. With the ṭikā of Viśvanātha. Copied by Paṇḍita Dūlīcandra, the pupil of Paṇḍita Sadāsukha Gaṇi, the pupil of Darśanasundara Gaṇi, the pupil of Kīrttiratna Sūri, at Mu-  
latāna on Saturday 21 March 1741.

F. Av. Blank.

Colophon on f. 50: iti śrīdaivajñadivākarātmajaśrīviśvanāthaviracitaṃ  
siddhāṃtarahasyagrahalāghavākhyakaraṇodāharaṇaṃ  
saṃāptaṃ astu (saṃāptaṃ astu deleted).

After this is written: anuṣṭubhaḥ 1821 ...

yādṛśaṃ pustakaṃ dṛṣtvā tādṛśaṃ liṣitaṃ mayā  
yadi śuddham aśuddham vā mama doṣo na dīyatāṃ 1  
bhagnaprṣṭikaṭigrīvā baddhadṛṣṭav adhomuṣaṃ  
kaṣṭhena liṣitaṃ śāstraṃ yatnena paripālayet 2  
tailād rakṣej jalād rakṣed rakṣe sithalabhaṃdhanāt  
mūrṣahaste na dātavyaṃ evaṃ vadati pustakaṃ || 3 ||

Post-colophon: saṃvat 1798 śāke 1663 mitī caitrasudi 15 śanau śrīmulatāna-  
madhye śrīkīrttiratnasūrisāśāyāṃ upaśrīdarśanasuṃdaragaṇitaśiṣyapaṃ. sada-  
suṣagaṇitaśiṣyapaṃ. dūlīcamda lipikṛtā.

F. 50v. Blank.

79. Puṇḍarīka jyotiṣa 269. Ff. 1–5 and f. (A). 10 × 21.5 cm. 9 lines. With marginal notes. Similar to manuscript 80. Incomplete. (tripraśnādhikāra 8–10). Copied on Monday 16 January 1826.



F. 1r begins, after the salutation, with tripraśnādhikāra 8a (p. 127, 1): vedeśāḥ 114.

On f. 3v ends the ṭikā on tripraśnādhikāra 10 (p. 134, 18): iti pāṭhaḥ yuktaḥ.

Ff. 3v–5v continue with the lemmata of the verses on ff. 4–4v of manuscript 80 with a ṭikā.

F. 5v ends:

mūlāvaśeṣakam (saikam) ṣaṣṭighnam vikalānvitam  
dviṣaṃguṇadvīyuktena mūlenāptam sphuṭībhavet

See the end of manuscript 245.

Date-formula: miti pauṣasudi | 11 || caṃdavāra saṃvat || 18 || 82.

On f. (A) a second scribe has written:

akṣa(c)chāyāvargatat(t)vām25śayuktā  
mārttaṃdā syād aṅgulādyo kṣakaraṇaḥ ||  
tathākṣa  
chāyeṣughnākṣabhāyāḥ kṛtidaśamalavonā yamāśāḥ palāṃśāḥ || 5 ||  
atha vedabdhyaḥ444naḥ kharasahrtaḥ śako yanāṃśāḥ |

These lines are found at the end of f. 4 of manuscript 80.

80. Puṇḍarīka jyotiṣa 17. Ff. A, 1–4, and B. 10 × 21.5 cm. 9 lines. With marginal notes. With the ṭikā of Viśvanātha. Incomplete (tripraśnādhikāra 8–10). Copied by Śyāmasundara for Dhaneśvarajī Puṇḍarīka on Monday 6 March 1826.

Ff. A–Av. Blank.

F. 1r begins, after the salutation, with tripraśnādhikāra 8a (p. 127, 1): vedeśāḥ 114.

F. 3v ends in the ṭikā on tripraśnādhikāra 10 (p. 134, 18): iti pāṭhaḥ || yuktaḥ.

There is no colophon.

Post-colophon: śrīḥ saṃvat 1882 miti māghakṛṣṇa 30 somavāsare likhitam idaṃ pustakam śāmasuṃdareṇa śrīdhaneśvarajīpaṇḍarī(ka)paṭhanārthaṃ.

On ff. 4–4v are written the following verses:

+ + [f. 4]dos tribhonaṃ tribhorddh(v)aṃ viśeṣyaṃ  
ra(sai)ś cakrato (')ṃkādikam syād bhujonaṃ  
tribhaṃ koṭir ekaikakam tritribhaiḥ syāt  
padaṃ sūryamaṇḍoccam aṣṭādrayo (')ṃśā [bhavet] || 1 ||  
meśādige sāyanabhāgasūrye  
dinārdhajā bhā palabhā bhavet sā ||  
triṣṭ(h)ā hatā(h) syur daśabhi|10|r bhujamgai|8|r  
ddigbhi|10|ś carārdhāni guṇo|3|ddhṛtāṃtyā || 2 ||  
syāt sāyanoṣṇāṃśubhujarkṣasaṃkhy(ā)(?)  
carārdhayogo lavabhogyaghātāt ||

khāgnyāptiyuktas tu caram dhanarṇam  
 tulājaṣadbhe tapane (')nyathāste || 3 ||  
 lamkodayā vighatīkā gajabhāni gomka-  
 dasrās (t)ripakṣadahanā(h) 278|299|323| kramagotkramasthāḥ ||  
 hīnānvitās caradalaiḥ kramagotkramasthair  
 meṣādito ghaṭata utkramata(s t(v) i)me syuḥ || 4 ||  
 golau staḥ saumyayāmyau kriyaghaṭarasabhe khecare hāyane te  
 nakrāt kīṭāc ca ṣadbhe (')tha carapalayutonās tu pa(m)ceṃdu15nāḍyaḥ ||  
 ghasrārdham golayo(h) syā(t) tadayutakhagunāḥ 30| syān nīśārdham  
 tathākṣa-  
 (c)chāyeṣughnākṣabhāyāḥ kṛtidaśamalavonāpamā(m)sāḥ palāṃsāḥ || 5 ||

Verse 5 is Gaṇeśa, *Grahalāghava*, tripraśnādhikāra 6.

atha vedābdhyabdhya444naḥ kharasahrtaḥ śako (')nyanāṃsāḥ ||

[f. 4v] rasa6rttviṣū5dadhi4dvi2bhūmitair lavādiko 'pamaḥ ||  
 dināṃśa15labdhakhaṇḍakair bhavet sukhāptaye (')thavā || 1 ||  
 ṣaṭṣaḍiṣū5dadhi4drk2kku2bhir arddhaiḥ  
 khetabhujāṃśadināṃśamitaikyaṃ ||  
 śeṣahataiṣyadināṃśayutam vā-  
 ṃśādyapamaḥ sukhasaṃvyavahrtyai || 2 ||

Verse 2 is Gaṇeśa, *Grahalāghava*, tripraśnādhikāra 12.

A second scribe has written in the margin of f. 4: saṃ 1888 śa 1753 ghāta  
 444 vākī 1309; and in the margin of f. 4v: bhāga 60 sāyana 21|49.

Ff. B-Bv. Blank.

81. Khasmohor 1086. Ff. 1-6. 16 × 28.5 cm. 9 lines. Folia torn. With some corrections. Incomplete.

F. 6v ends in pañcatārāspastīkaraṇa 17b (p. 111, 28): nagādri.

On f. 1 is written:

	1	2	3	4	5	6	7	8	9	10	11	12
0	41	81	117	150	178	199	212	212	195	155	89	0
0	25	47	68	84	98	106	108	102	79	66	36	0
0	63	126	186	246	302	354	402	440	461	443	326	0

82. Khasmohor 5086. Ff. 1-7. 14.5 × 31 cm. 14-16 lines. With the ṭikā of Viśvanātha. Incomplete.

F. 7v ends in pañcatārāspastīkaraṇa 1b (p. 88, 3): dr.

83. Khasmohor 5122a. Ff. 1-2. 14 × 31 cm. 10 lines. With the ṭikā of Viśvanātha. Incomplete.

F. 2v ends in ravicandraspaṣṭādhikāra 7d (p. 81, 19): bdhyabdhū.

84. Khasmohor 5283. Ff. 1-76. 11 × 25.5 cm. Scribe α: ff. 1-45r, 8-10 lines; scribe β: ff. 45v-76v, 11-16 lines. Folia torn. With marginal notes. With the ṭikā of Mallāri. Incomplete. Formerly property of Śiva Daivajña.

F. 76v ends in the ṭikā on candragrahaṇādhikāra 12 (p. 192, 27): jñātavyā. Ownership note on f. 1: śivadaivajñasyedaṃ

85. Khasmohor 5530. Ff. 1-12. 13.5 × 34 cm. 10-15 lines. With marginalia.

Colophon on f. 12: iti śrīnaṃdigrāmasthadaivajñaganeśaviracitaṃ siddhāntarahasyaṃ grahalāghavaṃ sampūrṇaṃ.

Price on f. 12v: kī ½.

The **GRAHALĀGHAVATĪKĀ**, a commentary on Gaṇeśa's *Grahalāghava* composed by Mallāri in ca. 1575/1600. CESS A4, 365b-367b, and A5, 285a. The first verse is:

nāke nākeśamukhyāḥ suravarānīvaḥ santi ye 'nantasaṃkhyā  
nakhyam ākhyaty amiśaṃ katham api ca manaḥpūrvakaṃ vān mādyā |  
ekaṃ hityaikadantaṃ sakalasuraśīraḥsaṅghasaṅgharṣitāṅghrīm  
śighraṃ bhakteṣṭasiddhipradam iha hi suraṃ sādaraṃ taṃ namāmi ||

See manuscripts 76 and 84.

The **SIDDHĀNTARAHASYODĀHARAṆA**, a commentary on Gaṇeśa's *Grahalāghava* composed by Viśvanātha in about 1620. CESS A5, 669b-674b. The first verse is:

jyotirvidguruṇā gaṇeśaguruṇā nirmathya sāstrāmbudhim  
yac cakre grahalāghavaṃ vivaraṇaṃ kurve 'sya satprīṭaye |  
smṛtvā śambhusutaṃ divākarasutas tad viśvanāthaḥ kṛti  
jāgrajyautisavaryagokulaparitrāṇāya nārāyaṇaḥ ||

See manuscripts 79, 80, and 82. Additional manuscripts:

86. Khasmohor 5535. Ff. 1-47 and 54-58. 11 × 22.5 cm. 10 lines. Lemmata only from the mula. Incomplete. Copied on ca. 16 April 1667.



F. 1 begins, after the salutation, with the heading to the pañcatārāspaṣṭīkaraṇādhikāra (p. 91, 1): athā bhaumādīnāṃ spaṣṭīkaraṇādhikāro vyākhyāyate.

F. 47v ends in the ṭīkā on grahayutyadhikāra 4 (p. 319, 26): natāṃśaḥ | te.

F. 54 begins in the ṭīkā on pañcāṅgacandragrahaṇānayanādhikāra 3 (p. 354, 19): 21|5|9.

Colophon on f. 58v: iti śrīdaivajñavaryyadivākarātmajavināthaviracitaṃ siddhāntarahasyodāharaṇaṃ || samāptaṃ.

After this comes a verse missing in the edition:

golagrāmanivāsino gurupadadvandvābjabhaktau ratasy-  
āsīt tatra divākarasya tanayaḥ śrīviśvanāthābhavayaḥ |  
tenedaṃ grahalāghavasya gaṇitaṃ spaṣṭīkṛtaṃ tad budhaiḥ  
śodhyaṃ śuddhaṃ idaṃ tadā tu gaṇakaiḥ svānte sadā dhāryatāṃ || 1 ||

Post-colophon: saṃvat 1724 vaiśākhaśukle akṣai tṛtīyāyāṃ liṣitaṃ idaṃ pustakaṃ.

Price on f. 1: kī o||j.

87. Khasmohor 5016. Ff. 1–114. 12 × 26 cm. 8/9 lines. With some marginalia. Sometimes the mūla is given in full, sometimes just lemmata are given. Copied by Tulārāma for Mahārājādhirāja Jayasimha on Friday 11 October 1706 (through the tripraśnādhikāra) and on Saturday 26 October 1706 (to the end).

Colophon on f. 41v (cf. p. 159, 3–4): iti śrīdivākaradaivajñātma-javiśvanātha-daivajñaviracite grahalāghave lagnādichāyāyaṃtrabhāgādiksādhanaanalikāvaṃdhādhikārasodāharaṇaṃ samāptaṃ.

Post-colophon: saṃ 1763 varṣe kārttikakṛṣṇa 1 bhṛguvāsare śrīmanmahārājādhirājajaiyasimhadevajīkasyājñayā likhitaṃ idaṃ tulārāmeṇa.

Colophon on f. 114: iti śrīdaivajñavaryyadivākarātmajaviśvanāthaviracitaṃ siddhāntarahasyodāharaṇaṃ saṃpūrṇaṃ.

Post-colophon: saṃ 1763 kārttikaśukla 1 śanau lekhaḥ mahārājādhirājamaḥārājaśrījaiyasimhadevajīkasyājñayā likhitaṃ idaṃ tulārāmeṇa.

88. Khasmohor 5355. Ff. 1–13. And Khasmohor 5362. Ff. 14–44. 11 × 25.5 cm. 17 lines. Jaina Nāgarī with occasional pūrvamātras. With some marginalia. Copied by ṛṣi Harsā and muni Lakṣmīcandra, the pupil of Mahopādhyāya Jagaccandra, the pupil of Vā(caka) Hīracandra, the pupil of Bhaṭṭāraka Jayacandra Sūri of the Pārśvacandrasūrigaccha, at Yovanera (Yodhapura?) on ca. 2 April 1710 from the favor of N(e)minātha.

Colophon on f. 44v: iti śrīdaivajñavaryyadivākarātmajaviśvanāthaviracitaṃ siddhāntarahasyodāharaṇaṃ samāptaṃ | iti śrīgrahalāghavasya vṛtti samāptā.

Post-colophon: saṃvat 1767 varṣe caitraśukla rākādine | śrīpārśvacandra-sūrigacche | bhaṭṭārakaśrījaya-candrasūrayas tadantevāsino vā° śrīhīracandra |

tacchiṣya mahopādhyāyaśrījagaccandraś tadantevāsī munilakṣmīcandraṇa lipī-  
kṛtā || १ haṣāsahitena | śrīyovaneramadhye śrīnamināthaprasādāt.

89. Khasmohor 5122b. Ff. 1-26. 14 × 31 cm. 14-16 lines. With some marginalia. Usually lemmata only from the mūla. Incomplete (ends with pātādhikāra). Copied at Jayapura on Wednesday 1 September 1756.

Colophon on f. 26: iti śrīdivākaradaivajñātmajaśvanāthadaivajñaviracitā  
grahalāghavākhyasiddhāntarahasyodāhṛtiḥ samāptā.

Post-colophon: samvat 1813 śāke 1678 bhādrapadamāsī śuklasaptamīyāṁ  
budhe samāptam śrījayasīṁhanāmarājanagare daḥ.

90. Puṇḍarīka jyotiṣa 35. ff. 1-85 and 85b-100. 10 × 26 cm. 7/8 lines. With some marginalia. Copied in 1788/9. Formerly property of Viśveśvara, the son of Rāmeśvara Puṇḍarīka.

Colophon on f. 99v: iti śrīdaivajñavaryadivākarātmajaśvanāthaviracitam  
śiddhāntarahasyodāharaṇam samāptam.

After this is written:

golagrāmanivāsino gurupadadvandvābjabhaktau ratasy-  
āsīt tatra divākarasya tanayaḥ śrīviśvanāthāhvayaḥ ||  
tenedam grahalāghavasya gaṇitam spaṣṭikṛtam tad budhaiḥ  
śodhyāṁ siddham idam tadā tu gaṇakaiḥ svānte sadā dhāryatām || 1  
[f. 100]āyus tena ravīravarddhatu sadā hemaṇtarātrir yathā  
lokānām priyadarśano bhava sadā hemaṇtasūryo yathā ||  
śātrūṇām raṇaduḥsaho bhava sadā hemaṇtatoyam yathā  
nāśamāntu tavārayo khalu sadā hemaṇtabham yathā || 1 ||

Post-colophon: samvat 1845.

Ownership note on f. 1:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
grahalāghavodāharaṇapustakam varttate śubham || 1 ||

91. Khasmohor 5284. Ff. 2-79. 11.5 × 26 cm. 9/10 lines. Folia torn. With some marginalia. F. 52 fills a lacuna left by the scribe, who numbered the folia after supplying it. Usually lemmata only from the mūla. Incomplete.

F. 2 begins in Viśvanātha's introduction (p. 4, 3): taśāstravicārasārakaturo.

F. 79v ends in an example of an eclipse-computation which I have not located in the published version of Viśvanātha's commentary: atha caṇḍrabimḃabhū-  
bhāśādhanam āha vitryaṁśeśā iti (cf. māsaṇādhikāra 13c) (|) piṇḍanāḍy-  
aṇtaram 3 asya ṣaḍaṁśaḥ 0|30| anena vitryaṁśeśā 10|40| n(ā)dyādiṇḍasya  
vidyamānatvāt yuktā jātam caṇḍrabimḃa(m) 11|10| atha bhūbhāśādhanam (|)  
piṇḍanāḍyaṇtara(m) 3 tri3ghnam 9(|) asya paṁcamāṁśena 1|.

92. Khasmohor 5536. A. ff. 1-7; and B. ff. 1-4 and (5). 11 × 23.5 cm. 9 to 11 lines. Incomplete (excerpts).

A f. 1r begins, after the salutation, in the introduction (p. 4, 6): maṅgalaṃ valaṃ vasantatikalenāha, and continues in the ṭikā on madhyamādhikāra (p. 4, 8): sā śrutir vedo jayati | kīdr̥ṣīti ślokenāha.

Shortly on f. 1r the text jumps to the ṭikā on madhyamādhikāra 4-5 (p. 11, 10): tatrādaṃ udāharaṇakramo liṣyate.

A f. 7v ends with the colophon to nakṣatracchāyādhikāra (p. 308, 8): iti nakṣatracchāyādhikārodāharaṇaṃ.

B f. 1r begins with the heading to the udayāsthādhikāra (p. 257, 17): atho-dayāsthādhikārodāharaṇaṃ.

B f. (5)v ends in an unidentified computation: 9|24|16 anena rahitaḥ 11|22|47 |13 kṣepakena 10|7|8 yuto jā.

93. Puṇḍarīka jyotiṣa 34. Ff. 1-52 and (53). 11 × 26 cm. 9/10 lines. Lemmata only from the mūla. Incomplete. Copied by and formerly property of Gokula, the son of Śambhūnātha Puṇḍarīka.

F. (53) ends in the ṭikā on māsaṅgaṇādhikāra 19 (p. 240, 26): atha.

F. (53)v. Blank.

Ownership and scribal note on f. 1:

śambhūnāthatanūjasya gokulasya vipaścitaḥ ||  
grahalāghavodāhṛter hi pustakaṃ jñeyaṃ vudhaiś śubhaṃ || 1 ||

tenaiva likhitam ity api śeṣaḥ ||

An anonymous **GRAHALĀGHAVAVĀRTTIKA**, a commentary on Gaṇeśa's *Grahalāghava* using the horoscope of Mahārāja Jayasimha as its udāharaṇa; this is dated Saturday 6 kṛṣṇapakṣa of Mṛgaśīra in Saṃ 1745, Śaka 1610 = 3 November 1688. The first thirteen verses are:

śrīmadvidyāguruṃ natvā dhyātvā devīm sarasvatīm ||  
grahalāghavasūtroktavārttikaṃ racayāmy aham || 1 ||  
asti svastimatī ramyāmbāvatī śālakāvatī ||  
yaśasvatsāgaraḥ śāsvat tatsthaḥ svacchāśayo 'likhat || 2 ||  
sakalāgamasārasvajñānavijñātakauśalāt ||  
gaṇeśavākyatas tattvaṃ viśadīkaravāṇi tat || 3 ||  
ekapañcāśadabdasya yātāḥ syur viśvanāḍikāḥ ||  
palāni caikavedāś ca trivedā akṣarāṇi tu || 4 ||  
iti brāhmyaṃ yātam āyur gaṇitāgame brahmaṇo  
divase kalpadvayaṃ kalpe ca te smṛtāḥ || 5 ||  
caturdaśāpi manavas tatrāyaṃ saptamo manuḥ ||  
vaivasvatas tatra mahaikasaptatīyugāni vai || 6 ||  
caturbhis tu yugair ekaṃ mahāyugam udīritam ||



tricaturlakṣaviṃśādhyaśāhasrais tu caturyugī || 7 ||  
 varṣair atyaṣṭilakṣāṣṭāviṃśādhikasahasrakaiḥ ||  
 kṛtaṃ kṛtayugaṃ proktaṃ prathamam sukṛtābhidham || 8 ||  
 catuḥsahasrair hīnaṃ tu dvāparaṃ viśvalakṣakaiḥ ||  
 catuḥsaṣṭisahasrais tu tretā varṣāṣṭalakṣakaiḥ || 9 ||  
 caturlakṣādhikair dantasahasrair abdakaiḥ kalih ||  
 aṣṭāviṃśatime caiva varttamāne mahāyuge || 10 ||  
 caturthaṃ caraṇam caiva kalir nāma niveditam ||  
 yudhiṣṭhiramahārājarājyāt pravarttitah kalih || 11 ||  
 tatra trayo 'mī saṃjātā bhūpālāḥ śakakārakāḥ ||  
 trayo 'grato bhaviṣyanti kalau ṣaṭ śakakārakāḥ || 12 ||  
 yudhiṣṭhiro vedakṛtābhrarāmair  
 varṣais tato vikramabhūmināthaḥ ||  
 tato 'pi pañcānalacandravarṣaiḥ  
 śrīśālisadvāhanaśākakarttā || 13 ||

Manuscript:

94. Puṇḍarīka jyotiṣa 38. Ff. 1-23. 11 × 25.5 cm. 11-13 lines. Many folia stuck together. Incomplete.

On f. 2 is written: saṃvat 1745 varṣe śāke 1610 pravarttamāne śrīmajjaya-simhajīmahārājasya janma.

Jayasimha's horoscope is given on f. 2v for: laukikamṛgaśīramāse kṛṣṇapakṣe 6 puṇyatithau śanivāsare ghaṭikā 25 palāni 32.

Planets	Text (Sidereal)	Computation (3 November 1688) (Tropical)
Saturn	Libra	221°
Jupiter	Capricorn	324°
Mars	Libra	24°(!)+180°=204°
Sun	Scorpius	231°
Venus' śighra	Scorpius	
Mercury's śighra	Scorpius	
Moon	Cancer	248°(!)
Rāhu	Aries	23°

F. 23 ends with the computation of the longitude of Mercury: iti tātkaṇṭhika-budhaḥ 7|24|17|26 idaṃ spaṣṭaḥ.

An unnamed karaṇa composed by Sūrya in about 1410 (an udāharaṇa is dated 12 śukla(?)pakṣa of Pauṣa in Saṃ 1465 = ca. 30 December 1408). The perserved sections are:

udayāstanirūpaṇa. Verses 1-19.  
 (mīśrika). Verses 5-21.  
 grahaṇavicāra. Verses 1-13.  
 grahayutinirūpaṇa. Verses 1-4.

The first verse is:

sānnidhyān mahasāṃ nidher diviṣado 'dṛśyatvam aste kadāpy  
 astah so 'bhihitas tadantaravatāṃ vyaktiḥ smṛtaś codgamah ||  
 tatrālpam vrajatāṃ raver avanibhūr gurvarkajānāṃ sadā  
 prāgasto hy udayo 'paratra himagor bahvāgatiḥ sūryataḥ ||

The last two verses are:

śāke bāṇarasāmareśagaṇite pauṣasya pūrvārdhake  
 dvādaśyāṃ gaṇitāgatā yutir abhūd devejyaśanyoḥ purā ||  
 rātrau taddivase tayos tu vivaraṃ dṛṣṭam caturbhir lavair  
 ākāśe gaṇitasya kā gatiḥ aho jyotirvidah procyatām || 3 ||  
 yaś candreṇa yutiṃ karoti svacaro yābhir ghaṭibhir niśi  
 spaṣṭas tatsamayodbhavas tu gaṇitāt taccandrayor antaram ||  
 tenaivāntarito bhaved iti muhuḥ saṃsādhayed antaram  
 khetānām iti vakti sūryagaṇako nānyo 'sty upāyo laghuḥ || 4 ||

A conjunction of Saturn and Jupiter occurred on 1 January 1405.

Manuscript:

95. Khasmohor 5446. Ff. 1-4. 12 × 28 cm. 12/13 lines. Incomplete.  
 F. 4v ends in grahayutinirūpaṇa 4d: laghuḥ.  
 There is no colophon.

## D. KOṢṬHAKAS

A (KHAṆḌAKHĀDYAKASĀRINĪ) based on the *Khaṇḍakhādyaka*, which had been composed by Brahmagupta at Bhillamāla in 665; the date and author of the sārīṇī are unknown. See *SATE*, pp. 175–176, and the *Graha-carasamuccaya* (ms. 144).

Manuscript:

96. Khasmohor 5174(k). 1f. 11 × 27 cm. Incomplete.

Recto. Table of the solar equation for 1 to 90 degrees; the maximum is 2;10,49° at an argument of 90°. A second number accompanies each entry, ranging from 2,15 at 1° to 0,19 at 90°. Labeled śrīmatkhaṇḍakhādyai.

Verso. Table of the mean motions of the Sun, the Moon, and the lunar anomaly for 1 to 16 days.

A SŪRYASIDDHĀNTASĀRINĪ based on the *Sūryasiddhānta*, which was composed in ca. 800; the date and the author of the *Sūryasiddhāntasārīṇī* are unknown.

Manuscript:

97. Khasmohor 5174(j). 1f. 8 × 17.5 cm.

Recto. A list of the rotations of the planets in a Mahāyuga:

Sū(rya)	4,320,000
Caṁ(dra)	57,753,336
Ca(ndra) u(cca)	488,199
Ca(ndra) pā(ta)	232,246
Maṁ(gala)	2,296,832
Vṛ(haspati)	364,220
Śa(ni)	146,568
bhājaka (civil days)	1,577,917,828

A table of the longitudes of the beginnings and ends of the 27 nakṣatras.

A verse. kalpāda 1,955,880,000.

ṣaḍguṇasya<sup>a</sup> grahasyādes triṁśadbhaktād grhādikam  
athavā pañcabhir bhaktād rāṣiḥ syād daśabhir lavāḥ | 1 |

a. ṣaṭguṇasya.

At right angles is written the following table:

Maṁ(gala)	164 28
Bu(dha)	144 225 50
Vṛ(haspati)	130 14
Śu(kra)	163 183 24
Śa(ni)	115 27



Below this is written: sūryasiddhāṃte bhagaṇāḥ (|) sū 4,320,000 (|) kudināḥ 1,577,917,828 śodhitāḥ (|) śeṣam 488,199 (|) etair vāṭikā kṛtāsti (|) vāṭikānīte ucce lavādi 1|34|16 dhanam kriyate (|) tadā sūryasiddhāṃtajam bhavati (|) pāṭhabhedena uccabhagaṇā(h) 488,21[1]6 (|) yadā vāṭikānīte ucce 4|42|48 dhanam tad eva |

Verso. A table of the motions of the planets in 7 days.

Sūryadinagatayah

sū	caṃ	maṃ	vu	vṛ	śu	śa	rā	u
0	3	0	0	0	0	0	0	0
6	2	3	28	[2]0	11	0	0	0
53	14	40	38	34	12	14	22	46
57	4	5	46	54	54	2	15	47
0	0	0	0	0	0	0	0	0

The corresponding mean daily motions are:

Sun	0;59,8,14,...°
Moon	13;10,34,51...°
Mars	0;31,26,25,...°
Mercury's śighra	4;5,32,17...°
Jupiter	0;4,59,8,...°
Venus' śighra	1;36,7,42,...°
Saturn	0;2,0,17,...°
Lunar node	(-)0;3,10,42,...°
Lunar apogee	0;6,41.

A table of the motion of the Moon's, Mercury's, and Venus' anomalies (kendras) for 1, 7, and 14 days.

caṃke	7	14	vukem	7	14	śukem	7	14
0	3	6	0	0	1	0	0	0
13	1	2	3	21	13	0	4	8
3	27	54	6	44	29	36	18	37
53	17	34	24	42 <sup>b</sup>	38	59	56	53
33 <sup>a</sup>	[1]4	[2]9	10	13	27	33	54	48
7	51	43	31	37	14	26	8	16

a. read 52. b. read 49.

A table of the beginnings of the 4 caraṇas of each of the 27 nakṣatras.

The **KARAṆAKUTŪHALASĀRIṆĪ** or **BRAHMATULYASĀRIṆĪ** composed by Nāgadatta on the basis of the *Karaṇakutūhala* composed by Bhāskara at Vijjādaṇḍa in 1183. See *SATIUS*, pp. 36–37. The first verse is:

natvā vallabhanandanam tadanu gopālāṃhripadmadvayam  
jñātvā śrīguruvākyato hy aharnīsam sadyuktim evādhunā ||

siddhānteṣu yathoktakhecaravidhiḥ suspaṣṭakoṣṭhair muhur  
madhyaspaṣṭavibhāgato grahagaṇān kurve dinaughād aham ||

### Manuscripts:

98. Khasmohor 5253(a). Ff. A, 1-5, and B. 11 × 26 cm. Copied by Tejabhāna on Thursday 11 May 1769, probably at Mulatāna.

Ff. A-Av. Blank.

F. 1. The instructional verses beginning natvā vallabhanandanam.

Colophon: iti śrikarṇakutūhalasāraṇyāḥ karṇamanyā mūlapadyāni.

F. 1v. Table 13. Precession.

Table of the longitudes of the apogees of the Sun, Mars, Mercury, Jupiter, Venus, and Saturn.

Table of the mean daily motions of the planets.

Table of the daśāntaras in ghaṭīs of the Sun, the Moon, the lunar apogee, and the lunar node at Mulatāna.

Table of the Rāmabījas:

ra	cam	u	pā	maṃ	bu	vṛ	śu	śa
0	0	0	0	1	11	3		
2	15	30	30	20	40	10		
+	-	+	-	+	+	-		

Table of the ahargaṇa since the epoch of the *Karaṇakutūhala*, 24 February 1183, for every 30 years from Śaka 1470 = A.D. 1548 (133,331) to Śaka 1740 = A.D. 1818 (231,935).

Table of the ahargaṇa from 1 to 30 years (only the ahargaṇas for 1 to 15 years filled in).

F. 2. Table of the mean motions of the lord of the year, the accumulated epact, the Moon, the lunar apogee, and the lunar node for 20-year intervals from Śaka 1665-1765 (= A.D. 1743-1843) and for 1 to 20 years. With this and the tables on ff. 2v-3v compare tables 1 to 9.

F. 2v. Tables of the mean motions of Mars, Mercury, Jupiter, Venus, and Saturn for the same intervals.

F. 3. Tables of the mean motions of the Sun, the Moon, the lunar apogee, and the lunar node for 1 to 12 months, 1 to 4 intervals of 6 days, and 1 to 5 days.

F. 3v. Tables of the mean motions of Mars, Mercury, Jupiter, Venus, and Saturn for the same intervals.

Ff. 4-4v. Tables 10, 11, 14, 16, 18, 20, and 22. Equations of the center. The argument is for 3,6,9,...90°, however, instead of 1,2,3,...90°, and the entries for increments to the velocities are omitted. The maxima differ from what is expected of a Brāhmapakṣa text:

Planet	Khasmohor 5253(a)	Brāhmapakṣa
Sun	2;11.0°	2;10.54°
Moon	5;2.41°	5;2.31°
Mars	11;31.48°	11;12.53°
Mercury	4;28°	6;3.38°
Jupiter	5;6°	5;15.47°
Venus	1;45°	1;31.50°
Saturn	7;40°	7;38.35°

F. 5. Tables 15, 17, 19, 21, and 23. Equations of the anomaly. The entries are for 6,12,18,...180° instead of 1,2,3,...180°, and the hypotenuse is omitted. Again the maxima are not canonical.

Planet	5253(a)	argument	Brāhmapakṣa	argument
Mars	40;16°	132°	41;17.59°	130°
Mercury	21;31°	108°	21;36.48°	110°
Jupiter	11;31°	102°	10;59.1°	100°
Venus	46;21°	138°	46;30.28°	140°
Saturn	6;22°	96°	6;10.7°	100°

F. 5v. Table of the apogees with the number of years in which their longitudes increase by 0;0,1°.

su	maṇ	bu	vṛ	śu	śa
2	4	7	5	2	7
17	10	10	21	19	26
17	2	28	21	51	37
10	32	7	48	57	33
8	16	9	4	7	86
1	1	1	1	1	1

Table of the mean daily motions of the planets; see f. 1v.

Table of the elongations from the Sun necessary for the occurrences of the stations.

maṇ	bu	vṛ	śu	śa	
5	4	4	5	3	
14	24	10	13	25	va(kra)
6	7	7	6	8	
16	6	20	17	15	mā(rga)

Colophon on f. 5v:

ṣaḍdvyastendumite varṣe rāḍhe ṣaṣṭhyāṃ gurau sudi |  
tejabhānena lipteyaṃ samulā sāraṇī mayā || 1 ||

Ff. B–Bv. Blank.

99. Khasmohor 5424(a)+5254(j). Ff. 1–15. 11 × 26 cm. Copied by Tejabhāna on Wednesday 26 April, 3, 24, or 31 May 1769.



F. 1. (5424(a)). The instructional verses beginning with *natvā vallabhanandanam*.

Colophon: *iti śrīkarnakutūhale vidagdhabuddhivallabha spaṣṭādhikāram*.

F. 1v. *atha vrahmatulyoktagrahāṇām spaṣṭīkaraṇe koṣṭakānusāreṇa sūtram pratipādayati...*

Table of the *ahargaṇa* from the *Karaṇakutūhala*'s epoch, 24 February 1183, for Śaka 1470 = A.D. 1548 (133,331) to Śaka 1740 = A.D. 1818 (231,935) in 30-year periods; and for 1 to 30 years.

Table of the days the Sun remains in each zodiacal sign and its daily motion while in that sign.

F. 2. Table 1. Mean motions of the Sun. But for 1-33 20 year periods instead of 1-60 here and in the other tables.

F. 2v. Table 2. Mean motions of the Moon.

F. 3. Table 3. Mean motions of the lunar apogee.

F. 3v. Table 4. Mean motions of the lunar node.

F. 4. Table 5. Mean motions of Mars.

F. 4v. Table 6. Mean motions of Mercury.

F. 5. Table 7. Mean motions of Jupiter.

F. 5v. Table 8. Mean motions of Venus.

F. 6. Table 9. Mean motions of Saturn.

F. 6v. Table 10. Equation of the center of the Sun. The changes in the daily motion are omitted here and elsewhere.

F. 7. Table 11. Equation of the center of the Moon. The maximum is 5;2,30° instead of 5;2,31°.

F. 7v. Table 14. Equation of the center of Mars.

F. 8. Table 16. Equation of the center of Mercury.

F. 8v. Table 18. Equation of the center of Jupiter.

F. 9. Table 20. Equation of the center of Venus.

F. 9v. Table 22. Equation of the center of Saturn. The maximum is 7;38,36° instead of 7;38,35°.

Ff. 10-10v. Table 15. Equation of the anomaly of Mars with the hypotenuse (the differences are omitted here and elsewhere). The maximum is 41;17,52° instead of 41;17,59°.

Ff. 11-11v. Table 17. Equation of the anomaly of Mercury. The maximum is 21;36,58° instead of 21;36,48°.

Ff. 12-12v. Table 19. Equation of the anomaly of Jupiter. The maximum is 10;58,23° instead of 10;59,1°.

Ff. 13-13v. Table 21. Equation of the anomaly of Venus.

Ff. 14-14v. Table 23. Equation of the anomaly of Saturn.

F. 15. Table 12. Just the solar declination and its differences; the lunar latitude is omitted.

Colophon on f. 15:

rasadvyaṣṭemḍumāne (')bde rādhe kṛṣṇe tithāḥ aheḥ |  
lipteyaṁ tejabhānena samulā sāraṇī budhe || 1 ||

F. 15v. Blank.

100. Khasmohor 5052. Ff. 1-12. 10.5 × 26.5 cm. Incomplete.

F. 1 A table of a function related to the length of a tropical year and week-day numbers for periods of 57 years from Śaka 1105 = A.D. 1183 to Śaka 2198 = A.D. 2276, and for 1 to 57 years. The entry for 57 years is 5,46,59; 6,5;14,48 × 57 = 5,46,59;3,36. The table continues for every pakṣa from amā of Caitra.

The mean motions are given as in the *Makaranda*, but with different parameters. The tables called vāṭikā give the mean motions for every 10 ghaṭikās so that the first entry multiplied by 6 is the mean daily motion.

F. 1v. Sun. 0;9,51,21,42,5,31,9° × 6 = 0;59,8,10,12,33,6,54°. The Rāmabīja is +0;2°, the deśāntara +0;0,22°.

F. 2. Moon. 2;11,45,48,17,11,10° × 6 = 13;10,34,52,31,43,7,0°.

F. 2v. Lunar apogee. 0;1,6,48,58,26,25,27° × 6 = 0;6,40,53,50,38,32,42°.

F. 3. Lunar node. (-)0;0,31,48,4,20,19,30° × 6 = (-)0;3,10,48,26,1,57,0°.

F. 3v. Mars. 0;5,14,24,41,37,34,21° × 6 = 0;31,26,28,9,45,26,6°.

F. 4. Mercury. 0;40,55,23,30,15,7,20° × 6 = 4;5,32,21,1,30,44,0°.

F. 4v. Jupiter. 0;0,49,51,28,58,22,13° × 6 = 0;4,59,8,53,50,13,18°.

F. 5. Venus. 0;16,1,17,18,29,19,40° × 6 = 1;36,7,43,50,55,58,0°.

F. 5v. Saturn. 0;0,20,3,50,35,48,23° × 6 = 0;2,0,23,3,34,50,18°.

F. 6-6v. Table 10. Equation of the center of the Sun. With the change in daily motion.

F. 6v-7. Table 11. Equation of the center of the Moon. With the change in daily motion.

F. 7-7v. Table 14. Equation of the center of Mars for 1° to 180° by itself as elsewhere. The maximum equation is 11;13° at 91°.

F. 7v-8. Table 15. Equation of the anomaly of Mars by itself as elsewhere. The maximum is 41;17° at 125°-130°.

F. 8v. Table 16. Equation of the center of Mercury. The maximum is 4;27°.

F. 8v-9. Table 17. Equation of the anomaly of Mercury. The maximum is 21;31° at 109°-113°.

F. 9v. Table 18. Equation of the center of Jupiter. The maximum is 5;16°.

F. 9v-10. Table 19. Equation of the anomaly of Jupiter. The maximum is 10;59° at 100°.

F. 10v. Table 20. Equation of the center of Venus. The maximum is 1;26°.

F. 10v-11. Table 21. Equation of the anomaly of Venus. The maximum is 46;35° at 136°.

F. 11v. Table 22. Equation of the center of Saturn. The maximum is 8;0°.

F. 11v-12. Table 23. Equation of the anomaly of Saturn. The maximum is 5;35° at 92°-97°.

F. 12v. 7 1/3 lines of prose in bhāṣā beginning: sāraṇī kā madhyama spaṣṭa karaṇa kī vidhi karṇakutūhale.

101. Khasmohor 5424(b). Ff. 1-13. 11 × 26 cm. Incomplete.

F. 1. Table 1. Mean motion of the Sun.

F. 1v. Table 2. Mean motion of the Moon.

F. 1v-2. Table 3. Mean motion of the lunar apogee.

F. 2-2v. Table 4. Mean motion of the lunar node.

F. 2v-3. Table 5. Mean motion of Mars.

F. 3-3v. Table 6. Mean motion of Mercury.

F. 3v-4. Table 7. Mean motion of Jupiter.

F. 4-4v. Table 8. Mean motion of Venus.

F. 4v-5. Table 9. Mean motion of Saturn.

F. 5-5v. Table 10. Equation of the center of the Sun. With the change in velocity as elsewhere.

F. 5v-6. Table 11. Equation of the center of the Moon. The maximum is 5;2.30° instead of 5;2.31°.

F. 6-6v. Table 14. Equation of the center of Mars. The maximum is 11;6.21° instead of 11;12.53°.

F. 6v-7. Table 16. Equation of the center of Mercury.

F. 7-7v. Table 18. Equation of the center of Jupiter. The maximum is 4;15.47° instead of 5;15.47°.

F. 7v. Table 20. Equation of the center of Venus.

F. 8. Table 22. Equation of the center of Saturn. The maximum is 7;38.36° instead of 7;38.35°.

F. 8-8v. Table 13. Precession for 1 to 66 10-year periods.

F. 8v. Table of the apogees of the Sun and the five planets.

ra	maṇ	bu	bṛ	śu	śa
2	2 <sup>a</sup>	7	5	2	7
18	8	15	12	28	28
0	30	0	30	0	0
0	0	0	0	0	0

a. read 4.

F. 8v. Table of deśāntaras in degrees, minutes, and seconds.

ra	caṇ	maṇ	bu	bṛ	śu	śa	u	pā
0	0	0	0	0	0	0	0	0
0	5	0	1	1	1	0	0	0
44	24	2	32	13	41	2	19	0

F. 8v. Table of bījas as in *The Rajamṛgāṅka of Bhojadeva*, Aligarh 1987, p. 59.

ra	caṇ	maṇ	bu	bṛ	śu	śa	u	pā
0	0	1	11	3	4	1	0	0
2	15	2	4	10	3	3	0	30
0	0	0	0	10	0	0	30	0
+	-	+	+	-	-	+	+	-

Ff. 8v-9v. Table 15. Equation of the anomaly of Mars with its hypotenuse as elsewhere. The maximum equation is 41;21.27° at 127°.



Ff. 9v–10v. Table 17. Equation of the anomaly of Mercury. The maximum is 21;37,40° at 109°.

Ff. 10v–11. Table 19. Equation of the anomaly of Jupiter.

Ff. 11v–12. Table 21. Equation of the anomaly of Venus. The maximum is 46;18,1° at 120°.

Ff. 12–13. Table 23. Equation of the anomaly of Saturn.

Ff. 13–13v. Table 12. Only the solar declination. The maximum is 1415 = 23;35° instead of 24°.

F. 13v. Incomplete table of the traikya for 1°–107°. Below it is written: *atha rājamṛgāṅkōktāni traikyāni*. Cf. *The Rājamṛgāṅka*, p. 61.

102. Khasmohor 5504(c). Ff. 17–23. 11 × 25.5 cm. Incomplete.

F. 17. End of table 19. Equation of the anomaly of Jupiter with its hypotenuse as elsewhere for 137° to 180°.

Ff. 17v–18. Table 20. Equation of the center of Venus with the differences and changes in velocity as elsewhere.

Ff. 18–20. Table 21. Equation of the anomaly of Venus.

Ff. 20v–21. Table 22. Equation of the center of Saturn.

Ff. 21v–23. Table 23. Equation of the anomaly of Saturn.

F. 23v. Blank.

103. Khasmohor 5504(d). Ff. 38–43. 11 × 26 cm. Incomplete.

Ff. 38–38v. Table 1. Mean motion of the Sun.

Ff. 38v–39. Table 2. Mean motion of the Moon.

Ff. 39–39v. Table 3. Mean motion of the lunar apogee.

Ff. 39v–40v. Table 4. Mean motion of the lunar node.

Ff. 40v–41. Table 5. Mean motion of Mars.

Ff. 41–41v. Table 6. Mean motion of Mercury.

Ff. 41v–42. Table 7. Mean motion of Jupiter.

Ff. 42–42v. Table 8. Mean motion of Venus.

Ff. 42v–43v. Table 9. Mean motion of Saturn.

Ff. 43v. Table of (cālanas) for 0 to 18 days.

Table of the āptasthānaka for 245 to 253 (days). The entry for 243 is 4 0;36,15 and that for 253 6 1;46,15.

Table of entries for 1/2, 1, 2, 3, 4, 5, 5 1/2, 6, 6 1/2, 7, 8, 9, 10, 11, and 0 (months?). The entry for 1/2 is 0 15;20,7; for 1 it is 1 0;40,15; for 11 it is 11;2;4,21; and for 0 it is 0 2;7,38.

The **MAHĀDEVĪ** composed by Mahādeva in 1316. See *CESS* A4, 374a–376b, and A5, 288a–289a. The instructions are in verse and entitled *Grahasiddhi*; the tables are described by O. Neugebauer and D. Pingree, “The *Mahādevī* of Mahādeva”, *PAPS* 111, 1967, 69–92, and in *SATIUS*, pp. 37–39. The first verse of the *Grahasiddhi* is:

siddhiṃ karotīśajakendrābhavī-  
 nādīn śivau kṣetrapavāggurūṃś ca |  
 cakreśvarābdhanabhaścarāśu-  
 siddher mahādeva ṛṣiṃś ca natvā ||

See manuscripts 138 and 140. Other manuscripts:

104. Khasmohor 5353(a). Ff. 1-2. 11 × 25 cm. 18-20 lines. The *Grahasiddhi* with a *Bālābodbha*. With marginal notes. Copied by Premarṣi at Medanarapura in 1674/5. The description of this manuscript is incomplete so that not all of the details are secure.

The ṭikā begins: śrīmahādevīśāstrasya bālābavodham karomi.

The mūla begins: siddhiṃ karotīśajakendrābhavī.

The ṭikā ends: spaṣṭādhikāras tu bodhabodhāna(?) bodhitam balabodhom idam samyak jagākhyena(?) jagajjanān(?)

Colophon: iti.

Post-colophon: sam 1731 medanarapure liṣitam premarṣiṇā

105. Khasmohor 5597. Ff. 1-4. 11.5 × 27 cm. 9 lines. Copied by Tejabhānu on Thursday 30 January 1755. Incomplete (*Grahasiddhi* only).

Colophon on f. 4: iti śrīmahādevakṛtā grahasoddhi sāranyā sūtram samāptam.

Post-colophon: samvat 1811 phālgunamāse kṛṣṇapakṣe tithau 3 guruvāre likhitam tejabhānuḥ.

106. Khasmohor 5598. Ff. 1-42. 11.5 × 27 cm. 13 lines. With marginal additions. With the ṭikā of Dhanarāja. Copied by Tejabhāna on Friday 13 February 1756.

Colophon on f. 42v: iti śrīmahādevyāḥ ṭikā samāptā.

Post-colophon: samvat 1812 śakaḥ 1677 māghe māse śuklapakṣe tithau trayodaśyām 13 śukre likhitā tejabhānena.

107. Khasmohor 5056. Ff. 1-6. 11 × 26 cm. 17/18 lines. Diamond-shaped space left blank in the middle of each page. The *Grahasiddhi*. With the ṭikā of Dhanarāja. With some marginalia and diagrams. Incomplete.

The mūla ends on f. 6v in 16a: gajā veda.

The ṭikā ends on f. 6v: vrahmatulyoktaprakāreṇābdakarmmasaṃskṛtarāsyā-dimadhyacandraḥ

4|12|46|40|31|52| aṃśādyo yaṃ dvādaśabhaktaḥ la.

108. Khasmohor 5200. Ff. 1-150. 11 × 25 cm. Tables.

Ff. 1-30v. Table 9. N=0 to 59.

Ff. 31-60v. Table 10. N=0 to 59.  
 Ff. 61-90v. Table 11. N=0 to 59.  
 Ff. 91-120v. Table 12. N=0 to 59.  
 Ff. 121-150v. Table 13. N=0 to 59.  
 Price on f. 1: kī 2j.

109. Khasmohor 5249(a). Ff. 1-44. 11 × 26.5 cm. Tables.  
 Ff. 1-30v. Table 9. N=0 to 59.  
 Ff. 31-44v. Table 10. N=0 to 27.

110. Khasmohor 5254(g). Ff. 1-10. 11.5 × 26.5 cm. Tables. F. 9 torn.  
 F. 1. Table 1a for 1 to 60.  
 F. 1v. Table 1b for 1 to 60.  
 F. 2. Table 2a for 1 to 60.  
 F. 2v. Table 2b for 1 to 60.  
 F. 3. Table 3a for 1 to 60.  
 F. 3v. Table 3b for 1 to 60.  
 F. 4. Table 4a for 1 to 60.  
 F. 4v. Table 4b for 1 to 60.  
 F. 5. Table 5a for 1 to 60.  
 F. 5v. Table 5b for 1 to 60.  
 F. 6. Table 6a for 1 to 60.  
 F. 6v. Table 6b for 1 to 60.  
 F. 7 Table 7a for 1 to 60.  
 F. 7v. Table 7b for 1 to 60.  
 F. 8. Variant of table 8a for 1 to 60.  
 F. 8v. Variant of table 8b for 0 to 60.  
 F. 9 Table 8b for 1 to 60; and table of the longitudes of Rāhu for 1 to 27  
 avadhis.  
 F. 9v. Table 8a for 1 to 60 (entry for 60 torn off).  
 F. 10. Variant of table 1a for 1 to 60.  
 F. 10v. Variant of table 1b for 0 to 59.

111. Khasmohor 5352. Ff. 1-4. 10 × 26 cm. 8 to 10 lines. Jaina Nāgarī.  
 With marginal glosses. The *Grahasiddhi*.

Colophon on f. 4: iti śrīmahādevakṛte grahasiddhau mahādevī saṃpūrṇā.

F. 4v. Two verses in corrupt Sanskrit on the vigraṭikās in 7 days (verse 1)  
 and 7 nights (verse 2).

Tables of the guṇakās (mean yearly motions) and kṣepakās (epoch longi-  
 tudes) according to the Saurapakṣa, the Āryapakṣa, and the Dṛkpakṣa. The  
 epoch is Śaka 1480 = A.D. 1558.



112. Khasmohor 5595. Ff. 1-76. 11 × 27 cm. Tables. With some marginal notes.

Ff. 1v-16. Table 9. N=0 to 59.

Ff. 16v-31. Table 10. N=0 to 59.

Ff. 31v-46. Table 11. N=0 to 59.

Ff. 46v-61. Table 12. N=0 to 59.

Ff. 61v-76. Table 13. N=0 to 59.

Ff. 76. Table of the true longitudes of the Sun for 1 to 27 avadhis.

Table of the longitudes of Rāhu for 1 to 27 avadhis.

The **MAHĀDEVĪDĪPIKĀ**, a commentary of the *Mahādevī* composed by Dhanarāja at Padmāvatī in 1635. *CESS* A3, 124a-124b; A4, 117b; and A5, 150a. The first two verses are:

vāsudevaṃ harim natvā śrīguroḥ pādapuṣkaram ||  
vāgdevīm tapanādīṃś ca herambam bhuvaneśvarīm || 1 ||  
mahādevoktasāranyā grahāṇām vidadhāmahe ||  
vṛttiṃ sāstrānusāreṇa daivajñānām sukhāptaye || 2 ||

See manuscripts 106 and 107.

The **MAHĀDEVĪBĀLĀVABODHA**.

See manuscript 104.

The **MAKARANDA** composed by Makaranda at Kāśī in 1478. *CESS* A4, 341a-343a, and A5, 268a-268b; *SATIUS* 39b-46b; and *SATE* 92. Edited with parts of the *ṭīkā*s of Divākara and Viśvanātha by Rāmajanma Miśra, Vārāṇasī 1982. The first verse is:

śrīsūryasiddhāntamatena samyag  
viśvopakārāya guruprasādāt ||  
tithyādipatram vitanoti kāśyām  
ānandakando makarandanāmā ||

Manuscripts:

113. Khasmohor 5174(h). 1 blank f.; I ff. 1-6; and II f. 1, f. A, ff. 2-6, f. B, and ff. 7-9, (10), and 11-14; and f. C. Ff Ar and Cr copied by a second scribe. 11.5 × 25 cm. Tables.

I f. 1v. Verse 1; table 1 for Śaka 1688 tp 1784 (A.D. 1766 to 1862); table 2 for 1 to 16 years; and table 3 for 0 to 26 pakṣas.

I ff. 2-2v. Table 4 for 0 to 59 horizontal and 0 to 54 vertical.

I f. 3. Table 5 for Śaka 1688 to 1784 (A.D. 1766 to 1812); and table 6 for 1 to 24 years.

I f. 3v. Table 7 for 0 to 14 months.

I ff. 4–4v. Table 8 for 0 to 59 horizontal and 0 to 54 vertical.

I f. 5. Table 9 for Śaka 1688 to 1784 (A.D. 1766 to 1862); and table 10 for 1 to 24 years.

I f. 5v. Table 11 for 0 to 14 months.

I ff. 6–6v. Table 12 for 0 to 59 horizontal and 0 to 54 vertical.

II f. 1. Table 17, parts 1–2, for (Śaka) 1628 to 1742 (A.D. 1706 to 1820), and for 1 to 57 years.

II f. 1v. Table 17, part 3, for 1 to 26 pakṣas.

II F. A. Repeat of II ff. 1–1v by a second scribe.

II f. Av. Table 13 for Śaka 1640 to 1784 (A.D. 1718 to 1862); table 14 for 1 to 24 years; table 15 for 1 to 12 zodiacal signs; and table 16 for 1 to 27 nakṣatras.

II f. 2. Table 18 for 1 to 1,0.

II f. 2v. Table 19 for 1 to 1,0.

II f. 3. Table 20 for 1 to 1,0.

II f. 3v. Table 21 for 1 to 1,0.

II f. 4. Table 22 for 1 to 1,0.

II f. 4v. Table 23 for 1 to 1,0.

II f. 5. Table 24 for 1 to 1,0.

II f. 5v. Table 25 for 1 to 1,0.

II f. 6. Table 26 for 1 to 1,0.

II f. 6v. Table 36 for 1, 13, 14, 15, 16, and 17 days.

II f. B. Table of the mean motion of Ketu to 9 sexagesimal places for 1 to 1,0.

II f. Bv. Blank.

II f. 7. Table 27 for 1° to 90°.

II f. 7v. Table 28 for 1° to 90°.

II ff. 8–8v. Table 29 for 1° to 180°.

II ff. 9–9v. Table 30 for 1° to 180°.

II ff. (10–10v). Table 31 for 1° to 180°.

II ff. 11–11v. Table 32 for 1° to 180°.

II ff. 12–12v. Table 33 for 1° to 180°.

II f. 13. Table of lunar latitude for 1° to 90° (maximum is 270' at 90°); and table of digits of lunar latitude measured in sixths for 1 to 30 units of 6° (maximum 90 at 15).

II f. 13v. Table of half-durations of a solar eclipse for 1 to 22 (maximum 4;38 ghaṭikās at 22); table 42 for 1 to 36 viṃśopakas; table of solar diameters in digits and of solar velocities in minutes and seconds for 1 to 12 saṅkrāntis; table 37; and the skeleton of a table of the elongations from the Sun for the Greek-letter phenomena according to the Brāhmapakṣa.

II f. 14. Table of solar declinations for 1° to 90° (maximum 1440' at 90°).

II f. 14v. Blank.

II f. C. 11 verses written by a second scribe. It begins: atha caṁdragrahaṇaṁ |

japadānādi ke proktaṃ yasmin jñaiḥ śreyam uttamam |  
 indubhāskarayor vacni tadgrahaṃ sacamatkṛtim | 1 |

Colophon: iti caṇdragrahaṇam ||

9 verses written by the same second scribe. It begins:

dor śāntakāle tribhāhīnalagnaṃ  
 dvidhāyanāṃsaiḥ sahitaṃ vidheyam  
 tadbāhubhāgāḥ śaracaṇdrabhaktās  
 tallabdhakoṣṭhe 'pamabhāgasamjñā | 1 |

Colophon: iti makaraṇḍavivṛttau sūryagrahaṇam.

II f. Cv. Blank.

114. Khasmohor 5174(g). 1 f. 20.5 × 10.5 cm.

F. 1. Table 52 of the *Makaranda* for lunar visibility. Horizontally the entries are for Rāhu in 1 to 12 zodiacal signs, vertically for the Sun in 1 to 12 zodiacal signs. Below this is written:

yāvaṃtyo ghaṭikā amābhinnā(h) kāryā(ś) ca ṣaṣṭitaḥ |  
 dinamānaghaṭīyojyā yā(h) sthitā(h) śeṣaṣṭitaḥ | 1 |  
 adhikā<sup>a</sup> cet samāyātā rāhuravyoś ca cakrataḥ |  
 tadā saṃdrśyate caṇdra<sup>b</sup> ūnenaiva pradṛśyate | 2 |  
 iti caṇdradarśanaśloka<sup>c</sup>.

a. adhiko. b. caṇdram. c. °ślokaḥ.

On the verso is written:

amānādyūnaśūnyarttuyutā<sup>a</sup> dinamitir yadi |  
 ravirāhughaṭībhyo (')lpā tadā caṇdro na drśyate | 1 |  
 a. ° nādyūnasūnya°.

The **MAKARANDAPADDHATIKĀRIKĀḤ**, a commentary on Makaranda's *Makaranda* composed by Harikarṇa in 1610. CESS A6. The first verse is:

natvā vāgīśapādābjaṃ harikarṇo mahāmatih ||  
 makarandakṛtau ślokāṃs tanute bālabodhakān ||

Manuscript:

115. Khasmohor 5496. Ff. 1-2. 11.5 × 25 cm. 14 lines. With some marginalia.

Colophon on f. 2v: iti makaraṇḍapaddhatikārikāḥ.

After this the original scribe has written 7 verses:



maṇḍāṃkaraṇdraṃ phalaśādhane yad  
 gatim svakīyāṃ guṇayec ca tena ⟨|⟩  
 vibhajya śaṣṭyā kalikādikaṃ tad  
 dhanarṇakaṃ madhyagatau vidheyam | 1 |  
 kulīranakrādigate svakeṇdre  
 maṇḍasphuṭā sā gaditā purāṇaiḥ |  
 tadūnitā syāt svacaloccabhuktiḥ  
 svaśīghrakēṇdrasya gatiḥ kalādyā | 2 |  
 drā⟨k⟩kēṇdrabhuktiḥ śīghrāṃtyaphalakosṭāṃtarāhatā ⟨|⟩  
 śaṣṭyāptā liptikādyam svam asvam agre ⟨'⟩dhihīnake | 3 |  
 deyam maṇḍasphuṭe tau syāt sphuṭabhuktiḥ khacāriṇām |  
 ṛṇena bahunā śuddhā tadā vakragatir bhavet || 4 ||

vaidai rūpena dhṛtibhis tithyaharghatikā yutāḥ |  
 madhoḥ sitādito ⟨'⟩tho syuḥ sarpāsyāḥ parapatrajāḥ | 1 |  
 evaṃ krameṇa catvāri viśve dhiṣṇe ghaṭiṣu ca ⟨|⟩  
 rāmā yogesubhūvedās tadghaṭiṣu kramād yutāḥ | 2 |  
 evaṃ syāt sthūlapaṃcāṅgaṃ varttamānād bhaviṣyakam |  
 palais tu ghaṭikāṇtaḥ syād aṃtaraṃ spaṣṭatas tataḥ | 3 |  
 iti paṃcāṅgasiddhiḥ ||

The **MAKARANDAVIVARAṆA**, a commentary on Makaranda's *Ma-*  
*karanda* composed by Divākara in ca. 1620. CESS A3, 108b–109b; A4, 111a–  
 111b; and A5, 141b–142a. Edited with Viśvanātha's *Makarandodāharaṇa* by  
 Umāśaṅkara Śarman Miśra at Vārāṇasī in 1886. The first verse is:

prajñāṃ yataḥ prāpya kṛtapratijñāṃ  
 spardhāṃ vidhatte prasabhaṃ pratijñāṃ |  
 ajño 'pi taṃ śrīśivanāmadheyam  
 gurūpamaṃ svīyagurum bhaje 'ham ||

#### Manuscripts:

116. Khasmohor 5299. Ff. 1–13. 12 × 26 cm. 9 lines. Includes the *Rājādinirṇaya*.

Colophons on f. 13v: iti śrīrājādinirṇaya samāptaḥ iti śrīmātaṃ makaraṇ-  
 davivaraṇaṃ samāptim.

Price: kīmati |·j|

117. Puṇḍarīka jyotiṣa 29. 1 blank f.; and ff. 1–9. 10.5 × 19 cm. 13 lines.  
 With marginal notes. Includes the *Rājādinirṇaya*. Copied by Mitrarāma Bhaṭa.  
 Formerly property of Govinda Kāka.

Colophon on f. 9v: iti śrīsakalagaṇakasārvabhaumaśrīkṛṣṇadivajñasu-tanṛ-  
 siṃhasūnena

divākareṇa viracitaṃ makaraṃdavivaraṇaṃ samāptaṃ.

Post-colophon: liḥ bhaṭamitrarāma.

Ownership note by a third scribe on f. 9v: govindakākopanāmaka.

Below the post-colophon and above the ownership note a second scribe has written:

kaler arddhapramāṇena bhājayed bhogyakaṃ kaleḥ ||  
lābdhaṃ tad dharmam ity āhur adharmo nyūnaviṃśatiḥ || 1 ||

The **MAKARANDAṬIPPANA** or **MAKARANDODĀHṚTI**, a commentary on Makaranda's *Makaranda* perhaps composed by Moreśvara, but in parts identical with Viśvanātha's *Makarandodāharaṇa*. Its epoch is 1622, but it uses an example for 1639. The first three verses are:

yadiyapadapaṅkajaḥ smaraṇataḥ surendrādayas  
tadaiva kamalālayālayatayā vilāsānvitāḥ ||  
bhavanti bhavasambhavāvibhavanāśanāḥ sarvadā  
jagadvijayasamṃyutaḥ sa jayatiha moreśvarāḥ || 1 ||  
dhyātvā viśveśvaram devaṃ  
natvā moreśvaram tathā ||  
smṛtvā viṣṇupadāmbhojaṃ  
tato labdhāvabodhakam || 2 ||  
kurve 'haṃ makarandasya ṭippanaṃ chātratuṣṭaye ||  
durbodhaṃ mandabuddhīnāṃ vāsanāhīnacetasam || 3 ||

Manuscript:

118. Khasmohor 5197. Ff. 1–32. 12 × 26.5 cm. 8/9 lines. With some marginal notes. Copied by Tulārāma at the command of Mahārājādhirāja Jayasiṃha on Sunday 8 December 1706.

Colophon on f. 32: iti makaraṃdodāhṛtiḥ.

Post-colophon: saṃ 1763 varṣe mārگاśīrṣakṛṣṇa 30 ravau śrīmanmahārājādhirājajīśrījayasiṃhadevajikasyājñayā

likhitam idaṃ tulārāmeṇa.

Price on f. 32v: kī || = j.

The **MAKARANDODĀHARAṆA**, a commentary on Makaranda's *Makaranda* composed by Viśvanātha at Kāśī in about 1634. CESS A5, 675b–676b. The first verse is:

natvā gajānanam devaṃ viśvanāthaḥ karoty asau ||  
uddāharaṇam uddānam makarandasya yatnataḥ ||

## Manuscripts:

119. Khasmohor 5378. Ff. 1-8. 11 × 25 cm. 18 lines. With some marginal notes.

Colophon on f. 8v: *iti makaraṁde ravigrahaṇaṁ samāptam.*

After the colophon are several lines in *bhāṣā*.

120. Khasmohor 5506. F. A; I ff. 1-8; and II ff. 1-8 and 8b-15. 15 × 23.5 cm. 16-19 lines. With marginalia. Incomplete. F. A is from a different manuscript copied by a different scribe; the beginning of the lines are cut off.

F. A. 3 lines of text on astrological medicine, beginning: *yaṁ || kiṁcid rat-nakośābhiprāyam uktam | tatra yeṣu nakṣatreṣu jvaritasya mṛtyur uktam tathā yeṣu ca kṛchreṇa bahubhir dinair jvaramuktir; and ending: graṁthalāghavāya svalpāmtaratvāt tathā ca jyotiṣārke.*

F. Av. 15 lines on the same subject, beginning: *maṁdārānyadine mṛdudhru-vacarakṣiprair valakṣe sudhāyoge bheṣajam ācaret; and ending: anyatra anyeṣu nakṣatreṣu rugṇo navabhir dinair virug bhavati etaj jyotiṣārkā.*

I f. 2v ends near the beginning of line 5: *yāni deśāmtarayojanāni bhavaṁti tāni sarvāni.*

I f. 3 begins: *sūryasya madhyamagatyā guṇitāni kāryāni.* With these two sentences *cf.* p. 6, 13-14.

I f. 8v ends: *evam caitraśuklapaurṇimāsyāṁ śanau āśu ghaṭīpaleṣu 30|44 meṣasamkrāntipraveśaḥ | evam vṛṣād iṣṭapī.* See p. 29, 16-17.

II f. 1 begins: *vahudhā yasmin dine prathamatithir bhavati tasminn eva dine meṣasamkramaṇam bhavati.* See p. 29, 13-15.

II f. 8v ends at the beginning of line 16: *ṣaḍbhakte labdhāni phalāni | etāni pūrvasthāpitadinamāna.* See p. 68, 19-p. 69, 1.

II f. 8b begins: *spāṣṭikaraṇam | śukralatā 43|19|30|19 deśāmtaram |4|50|.*

II f. 13r. Blank; f. 13v follows f. 12v.

II f. 15v ends, after *iti rohiṇīcakram ||*: *viṁśatyā guṇayed grāsam svas-vamānena bhājayet | viśvātmakagrahaṇam | samva 1716 morvo māpyenātmedi-va(?).*

Below this are a table of *rājas* and a *rohiṇīcakra*.

The **PĀTASĀRAṆĪ** composed by Gaṇeśa at Nandigrāma in 1522. *CESS* A2, 100b; A4, 74a; and A5, 72b. The first verse is:

vedābdhīndraviyukśakād guṇahatāt khāśvāptanādyūnitā  
rudrāḥ sārđhajināś ca sāvayavake tattulyayoge gate ||  
pātaḥ syād vyatipātavaidhrta itīhetā yuter nādikāḥ  
ṣaṣṭyāptāḥ svaghaṭīguṇāḥ sphuṭatarās tasmād apītaiṣyakāḥ ||



Manuscript:

121. Khasmohor 5517. Ff. 1–6. 12 × 25.5 cm. Tables. With some marginal notes.

Colophon on f. 6: iti śrīmatkeśavasāṃvatasarātmajagaṇeśadaivajñaviracitā pātasāraṇī samāptāḥ.

The **PĀTASĀRANĪVIVARAṆA**, a commentary on Gaṇeśa's *Pātasāraṇī* composed by Divākara in about 1630.

The first verse is:

śrīmacchivākhyam gaṇitajñacakra-  
cūḍamaṇim sajjanavṛndavandyaṃ ||  
vidur vido yaṃ dhiṣaṇena tulyaṃ  
taṃ naumi nityaṃ dhiṣaṇāptihetoḥ ||

Manuscript:

122. Khasmohor 5518. Ff. 1–3. 12 × 25.5 cm. 9 lines. Copied on ca. 20 November 1705.

Colophon on f. 3v: iti pātasāraṇīvivaraṇam.

Post-colophon:

saptāśvīrasabhūśāke pauṣakṛṣṇātmabhūtithau ||  
alekhīdam mayā tatra hetūr gurukṛpai mai ||

Price on f. 1: kī S|||.

The **BRHATTITHICINTĀMAṆI** composed by Gaṇeśa at Nandigrāma in 1552. *CESS* A2, 104a–104b; A3, 28a; A4, 75a–75b; and A5, 73b; *SATIUS* 50b–51a; and *SATE* 101. The canons were edited with the ṭīkā of Viṣṇu by V. G. Āpaṭe in *ASS* 120, Poona 1942, 2nd part. The first verse is:

natvā brahmaharīśvareśvarasutāryārkaḍikhetān dvijo  
'hno 'rdhenābdadinādisiddhidam ahaṃ tithyādicintāmaṇim ||  
kurve 'tyalpakṛtiṃ vidhāya bahulaṃ yatnaṃ gaṇeśaḥ kṛtī  
pūrvābhyo 'ticamatkṛtiṃ tithikṛtiṃ paśyantu sujñā iha ||

The **SUBODHINĪ**, a commentary on Gaṇeśa's *Brhattithicintāmaṇi* composed by Viṣṇu in about 1610. *CESS* A5, 703b–704a. The first verse is:

yatpādāmbujadarśanāt paramanirdoṣasphuradrūpiṇī-  
svasvājñānaghanāndhakāram anayā cetogrhaṃ śudhyati ||  
śuddhe cetasi cātmacintanam ato muktiḥ kim asyāḥ paraṃ  
tasmāt taṃ gurum ātmarūpam aparāṃ nityaṃ namaskurmahe ||

## Manuscript:

123. Puṇḍarīka jyotiṣa 31. Ff. 1-21. 11.5 × 23.5 cm. Lines per page not recorded. Only lemmata cited from the mūla. Copied on Sunday 15 November 1730. Formerly property of Jagannātha Samrāt, and later of Viśveśvara, the son of Rāmeśvara.

Colophon on f. 21: iti śrīsakalāgamācāryavaryadivākaradaivajñanasutaviṣṇu-daivajñāviracitau

brhacciṃtāmaṇivāsanābhāṣye sūkṣmarkṣadesāṃtarādisādhanaḍhyāyaḥ.

Post-colophon: samvat 1787 miti mārḡasākrṣṇa 2 rāvaḡ pustakaṃ samāptaṃ.

Ownership note after the post-colophon: idaṃ pustakaṃ śrīsamrātjījagannāthasya.

Ownership note on f. 1:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ||

brhacciṃtāmaṇeḥ pustakaṃ jagaj jñātu sarvadā |

The **SUBODHĀ** composed by Jayarāma at Alindrapūrī in 1557. *CESS* A3, 62b, and A4, 96a. The first verse is:

praṇamya gopālapadāravindaṃ  
bhavaṃ bhavānīṃ gaṇanāyakaṃ ca ||  
śrīsūryapūrvān akhilān nabhaścarān  
vakṣe 'tisūkṣmāṃ sugamāṃ subodhāṃ ||

## Manuscript:

124. Khasmohor 5519. F. A; and ff. 1-21. 13 × 23.5 cm. F. A: 13 lines; ff. 1-21: tables.

Colophon on line 2 of f. Av: iti subodhāsāraṇī samāptāḥ.

Below this is the skeleton of a table.

Ff. 1-1v. Table of the tithidhruva, the tithikendra, and the tithivārādi for Śaka 1479 to 1696 (= A.D. 1557 to 1774) in steps of 31 years and for 1 to 31 years.

Ff. 2-2v. Table of the nakṣatradhruva, nakṣatrakendra, and nakṣatravārādi for Śaka 1479 to 1743 (= A.D. 1557 to 1821) in steps of 24 years and for 1 to 24 years.

Ff. 3-3v. Table of the yogadhruva, yogakendra, and yogavārādi for Śaka 1479 to 1743 (= A.D. 1557 to 1821) in steps of 24 years and for 1 to 24 years.

Ff. 4-4v. Table of the tithikendra and the tithivārādi with their cālakas for 1 to 38 avadhis.

Ff. 5-5v. Table of the same sort for nakṣatras.

Ff. 6-6v. Table of the same sort for yogas.

Ff. 7-11v. Table of tithiphalas.

Ff. 12-16v Table of naksatraphalas

Ff. 17-21v Table of yogaphalas

Price on f. 21v: kimati || — |.

The **GRAHAKALPATARU** or **MANIPRADĪPA** composed by Raghunātha at Kāśi in 1565. CESS A5. 372a-372b. The first verse is:

natvā vāranarājavaktram amarair nirvighnatākāṁkṣibhir  
justam śamkaram isitaram api ca brahmādinā kaukasām ||  
saure kalpatarum pravacmi gaṇite śrisomabhāttātmajah  
kasyām śriraghunāthabhāttaganakāḥ prityai sa bhūyān satām ||

Manuscripts:

125. Khasmohor 5249(b). Ff. 18-52; also numbered 1-35 in upper left margins of the versos. 11 x 25.5 cm. Tables. Copied by Tejobhanu on Thursday 29 September 1757. The mean motion tables are for 1,000 to 9,000 days, 10,000 to 90,000 days, 100,000 to 900,000 days, and 1,000,000 to 3,000,000 days.

F. 18. Mean motion table of the Sun; at the end spaces for 1,000,000 to 7,000,000 days, but only that for 1,000,000 days filled in. The mean motion in 1,000 days is  $9^{\circ} 25:36.9.33^{\circ}$ , in 1 day  $0:59.8.10.10^{\circ}$ .

F. 18v. Mean motion table of the Moon to 3,000,000 days. The mean motion in 1,000 days is  $7^{\circ} 6:21.7.43^{\circ}$ , in 1 day  $13:10.34.52.4^{\circ}$ .

F. 19. Mean motion table of the Moon's apogee to 200,000 days. The mean motion in 1,000 days is  $3^{\circ} 21:22.55.11^{\circ}$ , in 1 day  $0:6.40.58.31^{\circ}$ .

F. 19v. Mean motion table of the Moon's node to 100,000 days. The mean motion in 1,000 days is  $-1^{\circ} 22:59.8.37^{\circ}$ , in 1 day  $-0:3.10.44.55^{\circ}$ .

F. 20. Mean motion table of Mars to 3,000,000 days. The mean motion in 1,000 days is  $5^{\circ} 14:1.9.46^{\circ}$ , in 1 day  $0:31.26.28.11^{\circ}$ .

F. 20v. Mean motion table of Mercury to 300,000 days. The mean motion in 1,000 days is  $4^{\circ} 12:19.4.58^{\circ}$ , in 1 day  $4:5.32.20.42^{\circ}$ .

F. 21. Mean motion table of Jupiter to 2,000,000 days (spaces to 6,000,000 days). The mean motion in 1,000 days is  $2^{\circ} 23:5.46.50^{\circ}$ , in 1 day  $0:4.59.8.49^{\circ}$ .

F. 21v. Mean motion table of Venus to 1,000,000 days. The mean motion in 1,000 days is  $5^{\circ} 12:8.47.1^{\circ}$ , in 1 day  $1:36.7.43.37^{\circ}$ .

F. 22. Mean motion table of Saturn to 3,000,000 days. The mean motion in 1,000 days is  $1^{\circ} 3:26.21.30^{\circ}$ , in 1 day  $0:2.0.22.53^{\circ}$ .

F. 22v. Mean motion of the Sun for 1 to 9 days, 10 to 90 days, and 100 to 1,000 days; and for days 14, 15, and 16 and 354, 355, 365, 384, and 385.

F. 23. Mean motions of the Moon for the same numbers of days.

F. 23v. Mean motions of the Moon's apogee for the same number of days.

F. 24. Mean motions of the Moon's node for the same numbers of days.

F. 24v. Mean motions of Mars for the same numbers of days.

F. 25. Mean motions of Mercury for the same numbers of days.

F. 25v. Mean motions of Jupiter for the same numbers of days.



F. 26. Mean motions of Venus for the same numbers of days.

F. 26v. Mean motions of Saturn for the same numbers of days.

F. 27. Table of the weekdays on which the Sun enters each of the twelve zodiacal signs; the entry for 1 is 3;56,22.

Table of the weekdays on which the Sun enters each of the twenty-seven nakṣatras; the entry for 1 is 3;56,31,4.

F. 27v. A four-by-four square of unknown purport (not magic).

10	12	9	46
11	7	31	14
0	27	44	6
2	14	25	27

Ff. 28–30. Table of the true longitudes and daily motions of the Moon for 1 to 248 days (nine anomalistic months). The entries for day 1 are 12;3° and 726', for 248 days 27;44° and 723'.

The first set of tables of the equations of the planets are for 1 to 20 units of 9° of increases in the argument and a column 21 for 0° of argument; the functions tabulated are the śighra and manda equations expressed in minutes and the hypotenuse expressed in units of which there are 60 in the radius of each deferent.

F. 30v. Table of the equations of Mars. The maximum śighra equation is 2420'=40;20° at 13×9=117°; the maximum manda equation is 690'=11;30° at 9=81° and 10=90°; and the extreme hypotenuses are 99 and 20.

Table of the equations of Mercury. The maximum śighra equation is 1290'=21;30° at 11=99°; the maximum manda equation is 267'=4;27° at 9=81°; and the extreme hypotenuses are 82 and 37.

F. 31. Table of the equations of Jupiter. The maximum śighra equation is 690'=11;30° at 10=90°; the maximum manda equation is 305'=5;5° at 9=81°; and the extreme hypotenuses are 72 and 48.

Table of the equations of Venus. The maximum śighra equation is 2780'=46;20° at 14=126°; the maximum manda equation is 104'=1;44° at 9=81° and 10=90°; and the extreme hypotenuses are 103 and 16.

F. 31v. Table of the equations of Saturn. The maximum śighra equation is 380'=6;20° at 9=81° and 10=90°; the maximum manda equation is 460'=7;40° at 9=81° and 10=90°; and the extreme hypotenuses are 66 and 54.

The second set of equation tables (actually true longitude tables) has as its double argument mean longitudes of the planets horizontally and the śighra argument vertically. The mean longitudes, at intervals of 20°, are 0°; 10°; 30°; 50°; 70°; 90°; 110°; 130°; 150°; 170°; 210°; 230°; 250°; 270°; 290°; 310°; 330°; and 350°. The śighra arguments, at intervals of 10°, are 0°; 10°; 20°; 30°; and so on to 350°. The entries are the true longitudes, with the śighra equation computed from the śighra argument, the manda from the distance of the mean longitude from that planet's apogee.

Ff. 32–36v. Table for Mars.

Ff. 37–40v. Table for Mercury.

Ff. 41–44v. Table for Jupiter.

Ff. 45–48v. Table for Venus.

Ff. 49–52. Table for Saturn.

F. 52v. Table of the beginnings of the 108 nakṣatracaraṇas.

Colophon: iti śrīraghunāthabhaṭṭaviracito grahakalpataruḥ samāptaḥ.

Post-colophon: samvat 1814 dvi āśvina vadi 2 gurau likhitam tejobhānunā.

126. Khasimohor 5594. Ff. 1–8. 11 × 28 cm. 11 lines. Instructions only, with some tables of functions described in verse.

Colophon on f. 8v: iti śrīraghunāthabhaṭṭaviraciti grahakalpataruḥ samāptaḥ.

After this is written:

śakah pūrṇābhraśakrai1400rahita inahato māsayug<sup>a</sup> dvir bhagāśvī 27 |  
 yuktonaś<sup>b</sup> caṇdraṣaṭkām61śaviyug atha radā32prāptamāsair<sup>c</sup> yug  
 ūrddh(v)aḥ |  
 triṃśannighno digādhyo dvir iṣuśara55yutaḥ svāgnipūrṇādri<sup>d</sup>703bhāgair  
 yuktono (')bdhyamga64labdhāvamaviyug aparo jīvapūrvo dyuvṛmda(h)  
 || 1 ||  
 ravau rudrabāṇāḥ śarābdhi(h)<sup>e</sup> khalokā  
 vidhau śambhubhūpākṛtiḥ<sup>f</sup> saptalokā(h) ||  
 vidhucce gajāḥ śakralokās trivarnā  
 nāgāṣṭāśvinaś cākṛtiḥ siddha pāte (|| 2 ||)  
 kuje (')rthā navākṣiṣubāṇā dhṛtiḥ syād  
 buddhocce yamāsth(y)amkadasrā radā(h) syuh |  
 gurau pūrṇam aṣṭemdava(h) śakrabhūpāḥ |  
 site lokasūryā manur naṃdasaṃkhyāḥ (| 3 ||)  
 śanau vedasaptesavaḥ pūrṇatulyāḥ  
 kramāt kṣepakāś ceti rāśyādaya(h) syuh ||

a. māsayuk. b. yuktopaś. c. radā 32 prāptimāsair. d. khāgnipūrṇādri.  
 e. śarābdhī. f. °bhūpākṣatiḥ.

Next to this is a table of the epoch mean longitudes; I present modern computations for 5 March 1478 in column 3.

Planet	Text (sidereal)	Computation (tropical)
Sun	11° 5;45,30°	354°
Moon	11° 16;22,37°	5°
Apogee	8° 14;3,43°	
Node	8° 28;22,24°	137°(!)
Mars	5° 29;55,18°	209°
Mercury's śighra	2° 2;29,32°	
Jupiter	0° 18;14,16°	27°
Venus's śighra	3° 12;14,9°	
Saturn	4° 7;5,0°	150°

The **TITHICŪDĀMAṆI** composed by Rāmacandra between 1560 and 1580. *CESS* A5, 479b–480a. The first verse is:

praṇamya puṣpadantākhyau śāradāṃ gaṇanāyakam ||  
tithisiddhiṃ kāmādugdhāṃ karomy alpamatiḥ sphuṭam || 1 ||

This and several other of the 18 verses of the introduction are taken from the *Kāmadhenu* composed by Mahādeva in 1357. In order to distinguish the *Tithicūdāmaṇi* I cite its second verse:

vighneśam ca giram gurum hariharam brahmārkamukhyagrahān  
natvā caiva guroḥ padābjayugalam prāptaprasādaḥ sudhiḥ ||  
śrīmadbhāskarakeśavādiracitān vīkṣyātha cūdāmaṇim  
śiṣyaprārthanayā karomi sugamam tithyādisiddhyai sphuṭam || 2 ||

Manuscript:

127. Khasmohor 5570. F. 1. 15 × 27 cm. 13 lines. Instructions only, without tables.

Colophon on line 6 of f. 1v: iti śrīrāmacandra viracitam tithicūdāmaṇi sam-pūrṇa.

The **KHETASIDDHI** composed by Dinakara in 1578. *CESS* A3, 104a–104b, and A5, 139a; *SATIUS* 53 (Anonymous of 1578); and *SATE* 101–112. The first verse is:

natvādaḥ gaṇanāyakam paśupatiṃ vāgdevatām khecarān  
sūryādīn kuladevatām nijagurum lakṣmīpatiṃ padmajam ||  
kurve daivajidam varo dinakarah śrīkhetasiddhiṃ mudā  
svalpam brāhmamatāśritam sugahanam vidvajjanānandinim ||

Manuscript:

128. Khasmohor 5125. Ff. 1–3. 10.5 × 25 cm. 9/10 lines. Instructions only. Incomplete.

F. 3v ends in 31c–d (numbered 35 in manuscript): dasrāśvī22pramitād ardhā śuddhi syāt va.

The **CANDRĀRKĪ** composed by Dinakara at Bārejya in 1578. *CESS* A3, 102b–104a; A4, 109a; and A5, 138a–139a; *SATIUS* 51b–53a; and *SATE* 101. The first verse is:



sūryaṃ candraṃ sadgurum bhaktipūrvaṃ  
natvā vaksye sūryacandrodbhavaṃ ca ||  
pattraṃ pañcāṅgābhidhaṃ buddhivṛddhyai  
grāhyaṃ tajjñair yuktimat tan mayoktam ||

#### Manuscripts:

129. Khasmohor 5247. Ff. 1–2. 11 × 27 cm. 11 lines. Instructions only.  
With marginal notes. Copied on Friday 22 November 1754.

Colophon on f. 2v: iti śrīmadākarācāryaviracitā candrārki sampūrṇaḥ.  
Post-colophon: saṃvat 1811 mārgaśīrṣe śukle pakṣe tithau 8 śukre.

130. Khasmohor 5015(a). Ff. 1–8 and 8b–10. 12 × 28 cm. Tables.  
Ff. 1v–4v. Table 1 of the *Candrārki*.  
Ff. 4v–7v. Table 2 of the *Candrārki*.  
Ff. 8–10. Table 4 of the *Candrārki*.  
Ff. 10–10v. Table 3 of the *Candrārki*.  
Colophon on f. 10v: iti caṃdrārkiśloka sampūrṇam.

131. Khasmohor 5015(c). Ff. 1–2. 12 × 28 cm. 11 lines. Instructions in 26 verses.

Colophon on f. 2: iti caṃdrārkiśūtraṃ sampūrṇam.

After this is written:

daśārdrādyā(h) striyas tārā | viśākhādyā napuṃsakayoḥ |  
tisras tataś ca mūlādyāḥ puruṣāḥ syuś caturdāśa || 1 ||  
striṇapūṃsayor mahāvṛṣṭiḥ || strīnapuṃsakayoḥ kvacit |  
strīstriyoḥ śītalacchāyā yoge puruṣayor na ca || 2 ||  
udayāstamane śukro || budhaś ca vṛṣṭikāraḥ |  
jalarāśisthitaś caṃdraḥ | pakṣaṃ[f. 2v]te saṃkrame[s] tathā | 3 |  
budhaśukrasamīpasthaḥ karoty ekārṇavāṃ mahīm |  
tayoḃ aṃtargato bhānuḥ | samudram api śoṣayet || 4 ||  
calaty aṃgārake vṛṣṭis tridhā vṛṣṭiḥ śanaiścāre |  
vārīpūrṇā(m) mahīm kṛtvā | paścāt saṃcarate maruḥ || 5 ||  
atīcāragate jīve vakrībhūte śanimāṅgale |  
hāhābhūtaṃ jagat sarva(m) rūṃdamuṃdā ca medinī || 6 ||  
bhaumavakreṇāvṛṣṭiḥ || budhavakre janakṣayam ||  
guruvakre jana[h]pīdā | śukravakre janaḥ sukhī || 7 ||  
śanīvakre bhaved rogaṃ | durbhikṣaṃ śatruvigrahaṃ || 8 || iti ||  
śuddhito dyugāṇo hīnaḥ sa caivam śuddhitas tyajet ||  
pātya bāṇāṃgavahnibhyaḥ || ābdhikaḥ syād[d] ahargaṇaḥ || 1 ||  
gatābdavṛṇdam gaṇayec ca rudrair  
adhaḥsthitam vyomagirīṃdubhakta(m) 170 ||  
yuktas tato cārugate dinasya || kharāṃabhaktā tithir atra śeṣā || 1 || iti ||

132. Khasmohor 5081. Ff. 1-10. 11 × 25.5 cm. Tables.

Ff. 1-4. Table 1 of the *Candrārākī*.

Ff. 4v-7. Table 2 of the *Candrārākī*.

Ff. 7-7v. Table 3 of the *Candrārākī*.

Ff. 7v-10. Table 4 of the *Candrārākī*.

133. Khasmohor 5082(e). 1 f. 11 × 25.5 cm. Tables. Part of manuscript 130?

Recto. Table 5 of the *Candrārākī*.

Verso is blank.

134. Khasmohor 5174(p). Ff. 5-7 and (8). 11 × 26.5 cm. Tables. Incomplete.

F. 5. End of Table 1 of the *Candrārākī* for 350 to 365 days.

Ff. 5-(8). Table 2 of the *Candrārākī*.

F. (8). Table 4 of the *Candrārākī* for 1 to 27 days.

F. (8v) is blank.

135. Khasmohor 5174(t). F. 1. 11 × 27.5 cm. Tables. Incomplete.

F. 1. Table 3 of the *Candrārākī*.

F. 1v. Table 5 of the *Candrārākī*.

136. Khasmohor 5175(a). Ff. 1-3. 11.5 × 29 cm. Tables. Incomplete. Written to be hinged at the left.

F. 1: maṇḍaphalaṃ traikyam rāma vijasaṃskṛtā spaṣṭā.

Ff. 1-3v. Table 1 of the *Candrārākī* for 0 to 333 days.

137. Khasmohor 5254(a). Ff. 1-4 and 1 blank f. 11.5 × 26.5 cm. Tables. Incomplete.

Ff. 1-4. Table 4 of the *Candrārākī*.

138. Khasmohor 5254(e). Ff. 1-2. 11.5 × 26.5 cm. Tables. Incomplete.

F. 1. Table 5 of the *Candrārākī* for Śaka 1500 to 1680 (= A.D. 1578 to 1758) in steps of 20 years, and for 1 to 20 years.

Ff. 1v-2v contain mean motion tables (which are entries from the labdha tables of the *Mahādevī*) for the same units of time.

F. 1v Mars and Mercury.

F. 2. Jupiter and Venus.

F. 2v. Saturn and the lunar node.

139. Khasmohor 5254(i). Ff. 1-7. 11.5 x 26.5 cm. Tables. Incomplete.  
 Ff. 1-4. Table 1 of the *Candrārki*.  
 Ff. 4v-7v. Table 2 of the *Candrārki*.

A set of labdha tables for the *Mahāderī* for Śaka 1500 to 1700 (= A.D. 1578 to 1778) in steps of 20 years and for 1 to 20 years for Mars, Mercury, Jupiter, Venus, and Saturn; cf. manuscript 138, ff. 1v-2v.

Manuscript.

140. Khasmohor 5176(a). F. 1. 11 x 25.5 cm. Tables.  
 F. 1v. bottom: samvat 1635 śāke 1500 thakī mahādevīnā upakaraṇa sapta grahāṇām 7.

The **ŚĪGHRASIDDHI TITHISĀRIṆĪ**, or **CAMATKĀRACINTĀ-MANĪ** composed by Dinakara in 1583. *CĒSS* A3, 104b, and A5, 139b; and *SATE* 112-114. The first verse is:

natvā gaṇeśam gaganecarāṇām  
 gaṇam prthag bhaktisamānato 'ham ||  
 kurve camatkāraśārārūpaṁ  
 saram grhītvā khalu śighrasiddhim ||

Manuscript:

141. Khasmohor 5051. Ff. 1-18. 11.5 x 25.5 cm. Instructions in 21 verses on ff. 1-1v. Tables on ff. 1v-18.

Colophon on f. 1v: iti dinakaraviracyām tithisāriṇyām camatkāracintāmanīyām pañcāṅgasiddhiḥ sampūrṇā.

F. 1v. Tables of the gunakāras, kṣepakas, and rāmabījas for the śuddhi, the abdapa, and the manda according to the *Brahmapakṣa*.

Function	Gunakāra	Kṣepaka	Rāmabīja
śuddhi	11.3.53.22.40	18.39.1.19.0	0.1.15.0.0
abdapa	1.15.31.17.17	0.42.35.23.0	0.0.10.0.0
manda	7.40.30.46.22	0.14.50.44.0	0.3.45.0.0

Table of kendras for tithis (27.59.33), nakṣatras (27.13.48), and yogas (29.16.1).

Table of gunakas and (kṣepakas) of the śuddhi, abdapa, and manda according to the *Digpakṣa* (read *Dr̥kpakṣa*).

Function	Gunaka	(Kṣepaka)
śuddhi	11.3.53.3.28	18.34.9.3
abdapa	1.15.31.15.45	0.40.35.38
manda	7.40.30.38(?) .31	0.6.25.33



Ff. 2–3v. Table 1 of the *Śighrasiddhi* for 0 to 371.

Ff. 4–5v. Table 2 of the *Śighrasiddhi* for 0 to 361.

Ff. 6–7v. Table 3 of the *Śighrasiddhi* for 0 to 388.

Ff. 8–10v. Table 6 of the *Śighrasiddhi*.

Ff. 11–13v. Table 7 of the *Śighrasiddhi*.

Ff. 14–16v. Table 8 of the *Śighrasiddhi*.

Ff. 17–17v. Table of the *abdapa*, *tithidhruva*, *nakṣatrayogadhruva*, *manda*, *tithikendra*, *nakṣatrakendra*, *yogakendra*, *tithibhoga*, *nakṣatrabhoga*, and *yogabhoga* for every year from Śaka 1556 to 1591 (= A.D. 1634 to 1669).

Ff. 17v. Tables 4 and 5 of the *Śighrasiddhi*.

Table of *bījas* and of parameters according to the *Āryapakṣa*.

F. 18. Table of the *gaṇakas* of the *tithidhruvas* and *tithikendras* for 0 to 370 in steps of 10 as well as for 371, together with their *cālakas*, *vārādis*, and *ghaṭyādis*.

Table of the *gaṇakas* of the *nakṣatradhruvas* and *nakṣatrakendras* for 0 to 360 in steps of 9 as well as for 361, together with their various *cālakas*.

F. 18v. Table of the *gaṇakas* of the *yogadhruvas* and *yogakendras* for 0 to 387 in steps of 9 as well as for 388, together with their various *cālakas*.

The **RĀMAVINODA** in its *koṣṭhaka* form, composed by Rāma at Kāśī in 1590. *CESS* A5, 427a–428b; and *SATE* 114–118. The first verse is:

gaṇapatiṃ abhivandya śrīśapādāravinda-  
smaraṇaviditatattvo 'nantajo rāmacandraḥ ||  
akabaranṛpaśākād vakti pañcāṅgapattraṃ  
grahagatisamavetaṃ rāmabhūpālatuṣṭya ||

Manuscript:

142. Puṇḍarika jyotiṣa 49. 1 blank f.; and ff. 2–4 and (5). 10.5 × 22 cm. 8 lines. Instructions only. Incomplete.

F. 2 begins with || 4 ||, followed by 5a:

saptāṅgarāmā nagabhūmayo bdhi.

Colophon on ff. 4v–(5): iti śrīsamastasāmantasāmantinīśiṃd ūrapūradūrot-sāraṇakāraṇanīṣṭṛpak ṛpāṇadhārāvaluptamedinīpatimuṇḍama ṇḍalīmaṇḍitaṃ caṇḍīśamūrttimahīmaṇḍanaśrīm adakavarasāhamahāmātyadhuryamahā rājā-dhirājaśrīrāmadāsadevakā[f. 5]ridevājñānaṃtabhaṭṭātmajarāmaviracite rāmavinodākhye pañcāṅgagrahānayanādhikārah.

F. (5v) is blank.

The *tithi*, *nakṣatra*, and *yoga* tables compiled by Harinātha at Kāśī on the basis of Rāma's *Rāmavinoda*. *CESS* A6. The first verse is:

dr̥ṣṭvā vinodaṃ rāmasya vinodaḥ kriyate 'dhunā ||  
 pañcāṅgaṃ harināthēna śiṣyasantoṣahetave ||

**Manuscript:**

143. Khasmohor 5588.  $\alpha$  ff. 1, (2), and 3–16; and  $\beta$  ff. 1–19 and 1f. 11.5 × 25 cm. Tables.

$\alpha$ . F. 1v. Table of tithis, vāras, and tithikendras for Śaka 1512 to 1720 (= A.D. 1590 to 1798) in periods of 16 years.

F. (2). Table of the same functions for 1 to 16 years.

F. (2v). Table of nakṣatras, vāras, and nakṣatrakendras for Śaka 1512 to 1800 (= A.D. 1590 to 1878) in periods of 24 years.

F. 3. Table of the same functions for 1 to 24 years.

F. 3v. Table of yogas, vāras, and yogakendras for Śaka 1512 to 1800 (= A.D. 1590 to 1878) in periods of 24 years.

F. 4. Table of the same functions for 1 to 24 years.

F. 4v. Table of the abdapas for Śaka 1512 to 1932 (= A.D. 1590 to 2010) in periods of 60 years.

F. 4v–5. Table of the abdapas for 1 to 60 years; the parameter for 1 year is 1;15,31,31,24.

F. 5v–8v. Table of the vāras and tithikendras for 0 to 407 tithis.

F. 8v–12. Table of the vāras and nakṣatrakendras for 0 to 408 nakṣatras.

F. 12v has just the skeleton of a table.

F. 13–16v. Table of the vāras and yogakendras for 0 to 406 yogas.

$\beta$ . Ff. 1–7. Table of tithi equations for 0 to 29 horizontal, 0 to 59 vertical.

Ff. 7–13. Table of nakṣatra equations for 0 to 29 horizontal, 0 to 59 vertical.

Ff. 13–19. Table of yoga equations for 0 to 29 horizontal, 0 to 59 vertical.

F. 19v is blank.

The extra folium has a similar table for 0 to 29 horizontal, 19 to 23 vertical, on the recto; the verso is incomplete.

Price on  $\alpha$  f.1: kī ||ḡ.

The **GRAHACĀRASAMUCCAYA**, an anonymous work on astrology and astronomy compiled in 1596. We describe only the astronomical parts.

**Manuscript:**

144. Khasmohor 4510. Ff. 1–5, (6–38), and additional folia. 29 × 13 cm. 27/28 lines. Writing parallel to the shorter edge. With marginalia. Bound in cardboard with a cloth cover bearing a flower design in pink and black and with a Persian-style flap. Ff. 1–(36v) copied by Devarṣi Jyotiṣi for Lakṣmīcandra at Sāgānāyari in Sam 1653, Śaka 1518 = A.D. 1596/7.

F. 3. An ayanāṃśakavidhi in 9 verses of which the first is:

grahamunividhuvahni3179miśritaḥ śākakālo  
 bhavati ayanavallī dvādaśādyam ca guṇyam ||  
 khakhasaramuni7500bhāgaṃ labhyate rāsim ādya  
 bhavati ayanamadhyam krāntiṣaṃdī vicintya || 1 ||

Ff. 3–3v. A saṅkrāntimahānakṣatradhruvāṃkakarttavayatā in 5 verses.

Ff. 3v–4. A ravibhagaṇavallī.

F. 4. A ravibījaśuddhamadhyama.

A candrabhagaṇavallī.

A caṇdrasabījamadhyama.

Ff. 4–4v. A kendraabhagaṇavallī.

Ff. 4v–5. A spaṣṭādhikāra following Āryabhaṭa.

F. 5. A tithyānayaṇa.

A nakṣatrānayaṇa.

Ff. 5–5v. A yogānayaṇa.

Colophon on f. 5v: iti paṃcāṃgatithyādhikāra samāptaḥ.

F. 5v. Table of the mean motion of the Sun for 1 to 16 and 29 to 30 days.

Table of the mean motion of the Moon for the same days.

F. (6). Table of the kendra for the same days.

Table of Rāhu for the same days.

Ff. (6–7). Table of the equations of the Sun and their differences for 0° to 90° (the maximum is 2;10,49° at 90°).

Ff. (7–7v). Table of the equations of the Moon and their differences for 0° to 90° (the maximum is 5;1,42° at 90°).

(Ff. (7v–9). Texts on Mars, Mercury, Jupiter, Venus, Saturn, and Rānu. The first verse is:

bhūmiputro vijānīyā(d) rūponā bhagaṇair yutā  
 vedaghnā somaputre ca bhagaṇonā dviṣaṃyutā || 1 ||

Colophon on f. (9): iti śrībrahmaguptācāryaviracite graṇthe khaṇḍakhādyake madhyamādhikāraḥ prathamah. In fact, none of these verses seems to come from the *Khaṇḍakhādyaka*.

F. (9v). A bhaumādikaspaṣṭādhikāra. It begins: śīghraṃ sthāpya maṇḍam pātya śīghrān madhye grahavisuddha ṣaḍūnaḥ.

Table of the mean motion of Mars for 1 to 16, 29 to 30, 353 to 355, and 383–385 days.

Ff. (10–11v). Table of the śīghra equations of Mars and their differences for 1° to 180° (the maximum is 40;37,44° at 131°).

Ff. (11v–12v). Table of the manda equations of Mars and their differences for 1° to 90° (the maximum is 11;10,0° at 90°).

Ff. (12v–14v). Table of the utkramajyās of Mars and their differences for 1° to 180° (the maximum is 40;30,33° at 44°). The utkramajyās are essentially the entries for the śīghra equations from 180° in reverse to 1°.

F. (14v). Table of the mean motion of Mercury for the same days.



Ff. (14v-16v). Table of the *śighra* equations of Mercury and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $22;53,22^\circ$  at  $116^\circ$ ).

Ff. (16v-17v). Table of the *manda* equations of Mercury and their differences for  $1^\circ$  to  $90^\circ$  (the maximum is  $4;27,52^\circ$  at  $90^\circ$ ).

Ff. (18-20). Table of the *utkramajyās* of Mercury and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $22;50,36^\circ$  at  $60^\circ$ ).

F. (20). Table of the mean motion of Jupiter for 1 to 16, 29 to 30, and 353-355 days.

Ff. (20-22). Table of the *śighra* equations of Jupiter and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $11;35,37^\circ$  at  $101^\circ$ ).

Ff. (22-23). Table of the *manda* equations of Jupiter and their differences for  $1^\circ$  to  $90^\circ$  (the maximum is  $5;6,16^\circ$  at  $90^\circ$ ).

Ff. (23-25). Table of the *utkramajyās* of Jupiter and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $11;30,0^\circ$  at  $72^\circ$ ).

F. (25). Table of the mean motion of Venus for 1 to 16 and 29-30 days.

Ff. (25-27). Table of the *śighra* equations of Venus and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $46;16,48^\circ$  at  $139^\circ$ ).

Ff. (27-28v). Table of the *manda* equations of Venus and their differences for  $1^\circ$  to  $90^\circ$  (the maximum is  $2;10,49^\circ$  at  $90^\circ$ ).

Ff. (28v-30v). Table of the *utkramajyās* of Venus and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $46;11,30^\circ$  at  $38^\circ$ ).

Ff. (30v-31). Table of the mean motion of Saturn for 1 to 16 and 29 to 30 days.

Ff. (31-33). Table of the *śighra* equations of Saturn and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $6;20,0^\circ$  at  $96^\circ$ ).

Ff. (33-34). Table of the *manda* equations of Saturn and their differences for  $1^\circ$  to  $90^\circ$  (the maximum is  $7;39,25^\circ$  at  $90^\circ$ ).

Ff. (34-36v). Table of the *utkramajyās* of Saturn and their differences for  $1^\circ$  to  $180^\circ$  (the maximum is  $6;20,23^\circ$  at  $81^\circ$ ).

Colophon on f. (36v): *iti śrīṣaṇḍaśādyake śani utkram(ā)ptajyā saṃpūrṇaṃ koṭhā 2664 paryaṃta.*

Post-colophon: *saṃvat 1653 varṣe śāke 1518 pravarttamāne sāgānayarimadhye liṣitaṃ jyotiṣi devaṛṣi ācāryaśrīṣlakṣmīcandrārthaṃ.*

Ff. (36v-37v). Various notes in *bhāṣā* and in *Samskṛta* including tables of the week-days on which the Sun enters each of the 12 zodiacal signs and of the 28 *nakṣatras* and texts on *karaṇas* and retrogressions.

F. (38). Verses on geography.

graharaṃdhra cāraṇapāvaka 3299-  
bhūgolārdhaṃ vadaṃti gaṇ(i)ta jñāh |  
rasarajanīkara 16 bhaktā [||]  
avaṃtīlaṃkāṃtaraṃ mānaṃ || 1 [||]  
ujjeṇīruhitakakukhya-  
jamunāhimagirinivāśīnāṃ  
deśāṃtaraṃ [||] na kāryā  
talleshā madhyasaṃsthita || 2 [||]

ujjenijāmyottarareṣāyāṃ prāk ṛṇaṃ dhanam paścāt ||  
deśāntarabhuktivadhāt bhūparināho dhṛtaḥ kalādyāptam || 3 (||)

pāṭhāntaram||

purī rākṣasāṃ devakanyātha kāmī  
sitah parvvataḥ parjvalī vatsagulmām ||  
purī cojjayanyāhvayā gargarāṭam  
kurukṣetramerur bhaven madhyareṣā|| 4 ||  
avaṃtiyāmyottarayojanāni  
saṃguṇya vāṇaiḥ 5 rasaḥ 6 bhājitāni ||  
hīnādhikāny aṃganakheṣu 206 kuryāc  
caṃdrābdhi 41 bhaktā viṣ(u)vatprabhā(h) syuḥ || 5 ||  
ayanalavadinaiḥ prāṇ meṣasamkrāntikālād  
bhavati divasamadhye yā prabhākṣ(y)aprabhā (||) sā ||  
daśa 10 gaja 8 daśa 10 nighnī sākṣabhāṃtyā tribhaktā  
pratigraha carakhaṃdāny āyanāṃśādyabhānoḥ || 6 (||)  
sarāṃśa 15 sahita rūpa(m)yugmāgnau 321 jojanāni ca |  
purutaḥ yoginīcakram aṃtaram rākṣasā(m) purī || 7 ||  
naṃdākṣā 59 bhujagā 8 raveḥ śaśigatiḥ khāṃkādrayo 790 (')kṣāgnayah  
35  
tumga(h)syāṃgakalā 6 kuveda 41 vikālāḥ pātasya rāmā 3 bhavā 11  
(||)  
māheyasya mahīguṇā 31 rasakarā 26 jñasyeṣusiddhā 245 radā(h) 32  
paṃce 5 jyasya sitasya śaḍṇava 96 mitā aṣṭau 8 śaner dve 2 kale | 1 (|)  
vrahmatulyenoktam ||

Verse 4 is I 14, verse 6 is II 19, and the last verse is I 13 of Bhāskara's *Karaṇakutūhala*.

An anonymous set of tables following the Saurapakṣa; their epochs are 1598 or 1618.

Manuscript:

145. Khasmohor 5349(a). Ff. 1–6. 11 × 26 cm. Tables.

F. 1v. Table of the śuddhi, the abdapa, the Moon, and its kendra from Śaka 1520 to 1700 (= A.D. 1598 to 1778) at intervals of 20 years.

Table of the same functions for 1 to 20 years.

Ff. 2–2v. Table of the śuddhi, the adhimāsa (to Śaka 1669 = A.D. 1747), and the abdapa from Śaka 1582 to 1724 (= A.D. 1660 to 1802).

Ff. 3–3v. Table of the mean longitudes with their bījas of the Moon, its apogee, Mars, Mercury, Jupiter, Venus, Saturn, and Rāhu from Śaka 1540 to 1680 (= A.D. 1618 to 1758) in intervals of 20 years.

Table of the mean longitudes of the same entities for 1 to 20 years.

Ff. 4–4v. Table of the mean longitudes of the Sun, the Moon, its apogee, Mars, Mercury, Jupiter, Venus, Saturn and Rāhu for 1 to 27 avadhis.

F. 5. Table of the mean longitudes of the same entities for 1 to 13 days.

Table of the mean daily motions of the same entities (Rāhu is placed between the Moon's apogee and Mars).

Ff. 5v–6. Table of the mean motions of the same entities (with Rāhu at the end) for 1 to 60 ghaṭīs.

F. 6v. Table of the equations of the manda of the Sun, the Moon, Mars, Mercury, Jupiter, Venus, and Saturn for  $10^\circ$  to  $90^\circ$  of argument at intervals of  $10^\circ$ .

Table of the equations of the śighra of Mars, Mercury, Jupiter, Venus, and Saturn for  $10^\circ$  to  $180^\circ$  of argument at intervals of  $10^\circ$ .

The **TITHIPATRACINTĀMAṆI** whose manuscript was copied in Saurāṣṭra in 1604.

Manuscript:

146. Khasmohor 5294. Ff. 2–13.  $12 \times 22$  cm. Incomplete. Copied by Govarddhana, the son of Śrīnātha(?) of the Nāgarajñāti, a resident of Jirṇadurga, for Dāmodara Miśra in 1604/5.

F. 2 begins: na(?)krāgnikoṣṭhe pūrvalikhitāni

nagāgnisaptabhiḥ 737r bhaktaṃ prthag maṇḍaṃ phalonitaṃ |  
dhruvanāḍyādinā yuktaṃ nija keṇdraṃ sphuṭaṃ bhavet || 8 ||

Colophon on f. 2v: iti tithipatracintāmaṇiḥ samāptaḥ.

Post-colophon: svasti saṃvat 1661 varṣe śrīmajjirṇadurganivāsinā nāgarajñātinā vyava(?)śrīhāthī(?)sutena govarddhanena tithipatracintāmaṇir alekhi samāptaḥ || || || miśraśrīdāmodarapaṭhanārthaṃ.

Ff. 3–6. Table of 0 to 371 tithis indicating their kendras and vārādis.

Ff. 6–9. Table of 0 to 361 nakṣatras indicating their kendras and vārādis.

Ff. 9v–13. Table of 0 to 388 yogas indicating their kendras and vārādis.

Ff. 13. Table of the weekdays on which the Sun enters each zodiacal sign.

Table of the weekdays on which the Sun enters each of the nakṣatras.

Table of abdapas according to the Brāhmapakṣa.

Colophon on f. 13: iti tithipatracintāmaṇiḥ samāptaḥ.

F. 13v. Table of kendra phalas and hāras for 0 to 27 tithis and nakṣatras and 0 to 29 yogas.

Price on f. 2v: kī =.

The **KHAGATARAṆGINĪ** composed by Goparāja according to the Saurapakṣa; its epoch is 1608. CESS A6. The first verse is:



praṇipatya gaṇādhiśaṃ goparājābhidhaḥ sudhīḥ ||  
saurānusāraṇīm spaṣṭām kurve khagatarāṅginīm ||

**Manuscript:**

147. Khasmohor 5049(b). Ff. 55b–64 and 67–93. 11 × 25 cm. 17 lines and tables. Incomplete.

Colophon on f. 56: iti spaṣṭagatiprakāraḥ.

F. 56v. Table of abdapeṣu saṃskārapalāni (correction in palas to the lengths of days). The argument is 0 to 12 (zodiacal signs) vertical and 0 to 27 (parts) horizontal. There are maxima at parts 16 to 18 of zodiacal sign 2 (Taurus)(2;1 ghaṭikās), and at parts 5 to 7 of sign 10 (Aquarius) (2;13 ghaṭikās), minima at part 20 of sign 6 (Libra)(0 ghaṭikās) and between part 18 of sign 12 (Aries?)(-0;2 ghaṭikās) and part 19 (+0;1 ghaṭikās).

Ff. 57–57v. Table of mean motions of the śuddhi, abdapa, Moon, Mars, Mercury, Jupiter, Venus, Saturn, the Moon's apogee, and its node; given are the kṣepakas and the mean motions for 1 to 9 years, for 10 to 90 years in steps of 10, and for 100 to 00 years in steps of 100.

Ff. 58–58v. Table of the mean motions of the same entities for 1 to 9 days, for 10 to 90 days in steps of 10, and for 100 to 300 days in steps of 100.

F. 59. Manda equation and velocity equation of the Sun for 0° to 90°. The solar apogee is at Gemini 17;16,48°, the maximum equation 2;10,34° at 90°.

F. 59v. Table of the manda equation and velocity equation of the Moon for 0° to 90°. Maximum equation 5;2,48° at 90°.

Ff. 60–60v. Table of the śighra equation, the manda equation, and the hypotenuse of Mars for 0° to 180°. Maximum śighra equation 40;16 at 130° to 132° and maximum manda equation 11;32° at 93° to 98°.

Ff. 61–61v. Similar table for Mercury. Maximum śighra equation 21;31° at 108° to 113° and maximum manda equation 4;28° at 92° to 93°.

Ff. 62–62v. Similar table for Jupiter. Maximum śighra equation 11;31° at 100° to 102° and maximum manda equation 5;6° at 91° to 95°.

Ff. 63–63v. Similar table for Venus. Maximum śighra equation 46;24° at 136° to 137° and maximum manda equation 1;45° at 85° to 97°.

Ff. 64–64v. Similar table for Saturn. Maximum śighra equation 6;22° at 94° to 98° and maximum manda equation 7;40° at 92° to 96°.

F. 67. Sāyana dinamānapatra for Burahānapura, where the akṣabhā is 4;30 digits. The argument is 0 to 11 zodiacal signs vertical and 0 to 29 degrees horizontal. The maximum daylight is 33;12 ghaṭikās at Cancer 0°, the minimum 26;48 ghaṭikās at Capricorn 0°.

F. 67v. Similar table for places where the akṣaprabhā is 5;0. The maximum is 33;33 ghaṭikās at Cancer 0°, the minimum 26;27 ghaṭikās at Capricorn 0°.

F. 68 Similar table for Citrakūṭa, Udayapura, and Sīrohī where the akṣaprabhā is 5;30. The maximum is 33;54 ghaṭikās at Cancer 0°, the minimum 26;6 ghaṭikās at Capricorn 0°.

F. 68v. Similar table, but giving half-daylights, for places where the aksabhā is 6:30. The maximum is 17:19 ghaṭikās at Cancer 0°, the minimum 12:41 ghaṭikās at Capricorn 0°.

F. 69. Similar table giving daylights for Kurukṣetra where the aksabhā is 7:0. The maximum is 34:58 ghaṭikās at Cancer 0°, the minimum 25:2 ghaṭikās at Capricorn 0°.

F. 69v. Similar table for Lāhōra where the aksabhā is 7:30. The maximum is 35:20 ghaṭikās at Cancer 0°, the minimum 24:40 ghaṭikās at Capricorn 0°.

F. 70. Similar table for Kāśmīra where the aksabhā is 8:0. The maximum is 35:41 ghaṭikās at Cancer 0°, the minimum 24:19 ghaṭikās at Capricorn 0°.

F. 70v. Similar table for Kābilanagara where the aksabhā is 8:30.

F. 71–71v. Verses in bhāṣā and Saṃskṛta on computing the ascendent. The first verse is:

tārkāliko 'rko 'yanabhāgayuktas  
tadbhogyabhagair udayo hataś ca (||)  
khāgnyu30ddhṛtas tam ravibhogyakālam  
viśodhayed iṣṭaghaṭipalebhyah (||) 1 (||)

Colophon on f. 71v: iti lagnaspastah.

F. 72. Table of the nirayanalagnasārāṇi for a place where the aksabhā is 4:30 digits. The argument is 0 to 11 (zodiacal signs) vertical and 0 to 29 (degrees) horizontal. In this and the following tables 0 (i.e., the vernal equinox) occurs at sign 11 (Pisces) 10°, so that the precession is 20°.

F. 72v. Similar table for a place where the aksabhā is 5:0.

F. 73. Similar table for a place where the aksabhā is 5:30.

F. 73v. Similar table for a place where the aksabhā is 6:0.

F. 74. Similar table for a place where the aksabhā is 6:30.

F. 74v. Similar table for a place where the aksabhā is 7:0.

F. 75. Similar table for a place where the aksabhā is 7:30.

F. 75v. Similar table for a place where the aksabhā is 8:0.

F. 76. Similar table for a place where the aksabhā is 8:30.

Colophon at bottom of f. 76: iti lagnasārāṇi samāptā.

F. 76v. Table for computing the cusps of the twelve bhāvas from the ascendent. Argument 0 to 11 (zodiacal signs) vertical and 0 to 29 (degrees) horizontal.

F. 77. Several short pieces in bhāṣā and Saṃskṛta on computing the cusps of the bhāvas. It begins: lagnani rāṣi sṃśa naim ko.

F. 77v. Table of the nirayanadaśamabhāva in units of 6°. Argument 0 to 11 (zodiacal signs) vertical and 0 to 29 (degrees) horizontal. The entry is 0:0 at sign 8 (Sagittarius) 11°.

Ff. 78–78v. Continuation of short pieces on f. 77.

Ff. 79–79v. Table for ṣaḍaṃśabhāva. The argument is as in the immediately preceding tables. The entry at 0° 0° is 15:0.0 (× 6 = 90), at 2° 0° 12:44.32 (× 6 = 76:15.12), and at 10° 0° 17:15.27 (× 6 = 103:32.42).

F. 80. Text on bhāvas.

F. 80v. Two tables entitled: *viśvānayanārthaṃ grahasaṃdhyantarakoṣṭakāḥ*. The argument in the first is 1 to 15 horizontal and 12;0 to 14;45 vertical in steps of 0;15; the argument in the second is 1 to 17 horizontal and 15;0 to 17;45 vertical in steps of 0;15.

Colophon on f. 81: *iti bhāvāḥ saṃpūrṇāḥ*

F. 81. Text on computing aspects of the planets. The first verse is:

uktāni yasmād bahudhā phalāni  
vyomaukasāṃ dr̥ṣṭisamudbhavāni <||>  
tasmāt pravacmy ānayanam <ca> dr̥ṣṭer  
horāvidāṃ dr̥kphalanirṇayāya <||> 1 <||>

F. 81v. Table of an unspecified planet's (the Moon's?) aspects. The argument is 1 to 9 vertical and 0 to 29 horizontal.

F. 82. Similar table of Mars' aspects.

F. 82v. Similar table of Jupiter's aspects.

f. 83. Similar table of Saturn's aspects.

Colophon on f. 83v: *iti grahāṇām dr̥ṣṭiḥ*.

Ff. 83v–87. Short astrological pieces.

Ff. 87v–93v. Verses on *dvādaśabhāvavicāra*. A second scribe has written at the top of f. 87v: *śrīpatipaddhati*.

The first verse is:

udayam janmabham lagnam horā śīrṣam dyutas tanuḥ <||>  
śarīram pūrvataḥ kalpaṃ svasthānam mūrttibhājanam <||> 1 <||>

It ends on f. 93v in verse 55:

ṣaṣṭāṣṭame yadā caṃdra ravir bhavati saptame <||>  
pitṛmātrdhanam

Neither verse is found in the *Śrīpatipaddhati*.

A derivative of the tables composed by Harideva in 1610 on the basis of the Babylonian Goal-year Periods.

Manuscript:

148. Khasmohor 5059(b). F. 2 (renumbered 1). 11 × 26 cm. Tables. Incomplete.

F. 2. Blank.

F. 2v. Table of Mercury for the years (Śaka) 1532 to 1545 (= A.D. 1610 to 1623). Each year has 3 columns corresponding to the 3 synodic periods of Mercury in each year (sometimes a fourth column is also used); each line



corresponds to a Greek-letter phenomenon, in order: first station ( $\Psi$ ), second station ( $\Phi$ ), last visibility in the West ( $\Omega$ ), first visibility in the East ( $\Gamma$ ), last visibility in the East ( $\Sigma$ ), and first visibility in the West ( $\Xi$ ). Each set of columns is valid not only for the first year, but for 46 years later (Śaka 1578 to 1591) and 46 years after that (Śaka 1624 to 1637). The entries are in degrees and minutes.

The **GANITAMAKARANDA** composed by Rāmadāsa Dave at Vaḍana-gara with 1618 as epoch. CESS A5, 490a-490b. The first verse is:

gaṇeśaṃ giraṃ kālam īsaṃ natvā  
yataḥ prasphuṭaṃ khetakarma pravakṣye ||  
avantyuttare saṁsthitā śuddhadantī  
maror maṇḍale śaṭtribhir yojanaś ca ||

Manuscript:

149. Khasmohor 5059(a). Ff. 1-9. 11 x 26 cm. 16-18 lines or tables. With some marginalia. Manuscript 148 is between ff. 1 and 2. Copied by Ṛṣi Thaṣa(?), the pupil of Ṛṣi Kaṭāji, the pupil of Ṛṣi Gamvajī(?), at Medanīpurī on ca. 7 December 1656.

Colophon on line 7 of f. 1: iti śrīgaṇitamakarande rāmadāsakṛtai miśrakā-dhyāyaḥ || prathamah || saṁpūrṇah ||

F. 1v ends, in line 11, in 2, 4c: triṁsatkoṣṭatithau 30 bhayogapritibhaṃ 27 keṇḍre svayuk sa.

F. 2. Table of the weekday on which the Sun enters each of the 12 zodiacal signs.

Table of the weekday on which the Sun enters each of the 27 nakṣatras.

Table of yearly parameters of the śuddhi, abdapa, tithidhruva, nakṣatra-yogadhruva, tithikendra, nakṣatrakendra, yogakendra, tithivāra, nakṣatravāra, and yogavāra.

Table of epoch entries for these functions.

Table of the cakras of tithis, nakṣatras, and yogas.

Table of tithikendrakṣepakas for 1 to 13 months.

Table of tithikendrakṣepakas for 1 to 13 months.

Table of nakṣatrakendrakṣepakas for 1 to 14 months (the entry for 1 month is 0;0,0).

F. 2v. Table of nakṣatravārādikṣepas for 1 to 14 months (the entry for 1 month is 0;0,0).

Table of yogakendrakṣepakas for 1 to 15.

Table of yogavārādikṣepas for 1 to 15.

Ff. 2v-3v. Table of tithikendras for 0° to 55° vertical in steps of 5° and for 0 to 29 horizontal.

Ff. 3v-4v. Similar table of nakṣatrakendras.

Ff. 4v-5. Similar table of yogakendras, but the vertical argument is 0° to 35° in steps of 5°, and then 50°, 55°, 0°, and 5°. At the bottom of f. 5 is

the colophon: iti śrīgaṇitamakaraṇḍe rāmadāsakṛtau tithyādipañcāṅgasiddhiḥ dvitīyo dhyāyaḥ || 2 || followed by the beginning of adhyāya 3.

F. 5v ends with the colophon: iti śrīgaṇitamakaraṇḍe rāmadāsakṛtau grahasiddhiḥ spaṣṭādhikāraḥ tṛtīyaḥ.

F. 6. Table of the mean yearly motions of the epact, the lord of the year, the Sun, the Moon, Mars, Mercury, Jupiter, Venus, Saturn, the lunar node, and the lunar apogee.

Table of the epoch positions of the same entities.

Table of the longitudes of the apogees of the Sun, Mars, Mercury, Jupiter, Venus, and Saturn.

Table of the Rāmabījas of the Sun, the Moon, Mars, Mercury, Jupiter, Venus, Saturn, the lunar node, and the lunar apogee.

Table of the mean daily motions of the same entities.

Table of the mean motions of the same entities in a period of 14 days.

Table of the manda equations of the Sun for arguments of 10,20,30,...90 degrees.

Table of the manda equations of the Moon for the same arguments.

Table of the manda equations of Mars for the same arguments.

Table of the manda equations of Mercury for the same arguments.

Table of the manda equations of Jupiter for the same arguments.

Table of the manda equations of Venus for the same arguments.

Table of the manda equations of Saturn for the same arguments.

Table of the śīghra equations of Mars for arguments of 10,20,30,...180 degrees.

Table of the śīghra equations of Mercury for the same arguments.

Ff. 6–6v. Table of the śīghra equations of Jupiter for the same arguments.

F. 6v. Table of the śīghra equations of Venus for the same arguments.

Table of the śīghra equations of Saturn for the same arguments.

Ff. 6v–7. Table of the elongations from the Sun at the occurrences of the Greek-letter phenomena of Mars, Mercury, Jupiter, Venus, and Saturn.

Colophon on f. 6v: iti śrīśrīgaṇitamakaraṇḍe samadākṛtau grahasiddhiḥ spaṣṭādhikāraḥ tṛtīyaḥ || 3 ||

F. 7 begins with 4, 1a: ṣaṣṭighnā 60.

Colophon on f. 9v: iti śrīgaṇitamakaraṇḍe rāmadāsakṛtau vakramārgrādi udayāstagrahayutivyatipātau caṇḍradarśano dhyāyo ṣṭamaḥ.

Post-colophon: likhitam ṛṣi śrīśrīśrīśrīśrīgamvājī(?)

tacchiṣya ṛṣi śrīśrīśrīketājī tacchiṣya ṛṣi thaṣena pravācya nārtham | śrīmedanī-purīyām || saṃvat 1713 varṣe poṣasudi 2 di(ne).

The **KHETAKAUTŪHALA** composed by Sūrajit at a royal city (Ahmadabad?) on the bank of the Kāśyapanandini (Sabarmatī) in 1619. The first verse is:

namaskṛtya durgāṃ śivaṃ vighnarājaṃ  
guruṃ śrīdharaṃ khecarāṃś cārkapūrvān ||

pravakṣye sphuṭam khetakautūhalākhyam  
vināyāśasiddhipradam sūranāmā ||

Manuscript:

150. Khasmohor 5607. Ff. 1-4. 16 × 29 cm. 15 lines. Edges of leaves irregular and tattered. With some marginalia.

Colophon on f. 4: iti śrīdāmodarātmajasiṃhajitsutasūrajidviracite khetakautūhale asmād udvaritayoḥ avadhigraṃthayo grahasāadhanādhyāyaḥ || sam-āpto khetakautūhalaḥ.

An udāharaṇa on Sūrajit's *Khetakautūhala* composed in 1628 or 1629. It begins: atha śetakutūhale udāharaṇam aharggaṇa 363.

Manuscript:

151. Khasmohor 5602. Ff. 1-3. 16 × 30 cm. 21-24 lines. With marginal notes. Incomplete.

F. 3v ends in the section on Venus: spaṣṭaḥ śukraḥ gatispaṣṭīkaraṇam.

The **GRAHALĀGHAVASĀRINĪ** composed by Nīlakaṇṭha in about 1630. *CESS* A3, 174b; A4, 142a; and A5, 184b-185a. The first verse is:

gaṇādhīśam namaskṛtya grahalāghavasāriṇī |  
kriyate nīlakaṇṭhena śiṣyasantoṣahetave ||

Manuscripts:

152. Puṇḍarīka jyotiṣa 36. Ff. 1-18. 11 × 26 cm. 12 lines; and tables. Copied by Gopīnātha for Gokulanātha. Formerly property of Gokulanātha, the son of Śambhūnātha Joṣī.

Colophon on f. 3: iti śrīmatsakalagaṇakasārvabhaumaśrīmachivagaṇakasutena

nīlakaṇṭhena viracitāyām grahalāghavasāraṇyām bhaumādipamcagrahaspaṣṭīkaraṇam sampūrṇam.

f. 3v. Blank.

Ff. 4-4v. Tables of the mean motions of the Sun, the Moon, the Moon's apogee, Rāhu, Mars, Mercury's kendra, Jupiter, Venus' kendra, and Saturn for 1 to 9 days and for 10 to 60 days in steps of 10.

F. 4v. Table of the mean motions of the same nine entities and of the Moon's kendra, Mercury's śighrocca, and Venus' śighrocca for 7 days.

Table of the yearly motions with their bījas of the Lord of the year (1;15,31,31,24 days), the Epact (11;3,53,15 tithis), the Sun (0° 0;0,0,0°), the Moon (4° 12;46,41,0°), the Moon's kendra (3° 2;5,40,42°), Rāhu (19;21,12,12°), Mars (6° 11;24,9,0°),



Mercury ( $1^{\circ} 24;45,22,48^{\circ}$ ), Jupiter ( $1^{\circ} 0;21,3,26^{\circ}$ ), Venus ( $7^{\circ} 15;11,44,25^{\circ}$ ), and Saturn ( $12;12,53,36^{\circ}$ ).

Table of the mean motions of the Sun, the Moon, the Moon's apogee, Rāhu, Mars, Mercury, Jupiter, Venus, and Saturn in a quarter, a half, three quarters, and a complete day.

F. 5. Table of the mean motions of the Sun for 1 to 40 cycles (of 4016 days = 11 "years) and for 1 to 9 days, 10 to 90 days in steps of 10, 100 to 900 days in steps of 100, and 1000 to 4000 days in steps of 1000.

F. 5v. Table of the mean motions of the Moon set up like that for the Sun.

F. 6. Table of the mean motions of the Moon's apogee set up in the same way except only for āṅkas 1 to 39.

F. 6v. Table of the mean motions of Rāhu set up in the same way as that for the Moon's apogee.

F. 7. Table of the mean motions of Mars set up as is the preceding.

F. 7v. Table of the mean motions of Mercury's kendra set up as is the preceding.

F. 8. Table of the mean motions of Jupiter set up as is the preceding.

F. 8v. Table of the mean motions of Venus' kendra set up as is the preceding.

F. 9. Table of the mean motions of Saturn set up as is the preceding.

F. 9v. Table of the manda equation and correction to the velocity of the Sun for  $0^{\circ}$  to  $90^{\circ}$  of argument; the maximum is  $2;10,54^{\circ}$  at  $90^{\circ}$ .

F. 10. Similar table for the Moon; the maximum is  $5;1,40^{\circ}$  at  $90^{\circ}$ .

F. 10v. Similar table for Mars; the maximum is  $13;0,0^{\circ}$  at  $90^{\circ}$ .

F. 11. Similar table for Mercury; the maximum is  $3;36,0^{\circ}$  at  $90^{\circ}$ .

F. 11v. Similar table for Jupiter; the maximum is  $5;42,0^{\circ}$  at  $90^{\circ}$ .

F. 12. Similar table for Venus; the maximum is  $1;30,0^{\circ}$  at  $90^{\circ}$ .

F. 12v. Similar table for Saturn; the maximum is  $9;18,0^{\circ}$  at  $90^{\circ}$ .

F. 13–13v. Table of the śighra equation and correction to the velocity of Mars for  $0^{\circ}$  to  $180^{\circ}$  of argument; the maximum is  $40;0,0^{\circ}$  at  $135^{\circ}$ .

Ff. 14–14v. Similar table for Mercury; the maximum is  $21;12,0^{\circ}$  from  $105^{\circ}$  to  $120^{\circ}$ .

Ff. 15–15v. Similar table for Jupiter; the maximum is  $10;48,0^{\circ}$  at  $105^{\circ}$ .

Ff. 16–16v. Similar table for Venus; the maximum is  $46;6,0^{\circ}$  at  $135^{\circ}$ .

Ff. 17–17v. Similar table for Saturn; the maximum is  $5;42,0^{\circ}$  from  $90^{\circ}$  to  $105^{\circ}$ .

F. 18. Tables of the elongations from the Sun required for the occurrence of the Geek-letter phenomena for each of the planets.

Colophon on f. 18: iti śrī matsakalagaṇakasārvabhaumaśrī machivagaṇakasutena

viracitāyāṃ grahalāghavasāriṇyāṃ bhaumādipaṃcagrahaspaṭīkaraṇaṃ saṃpūrṇatām agamat.

Post-colophon: li. gopīnāthena gokalanāthasya paṭhan(ārthaṃ || vismaranārthaṃ ca).

F. 18v. Blank.

Ownership note on f. 1: idaṃ joṣī śaṃbhūnāthasutagokulanāthasya pustakaṃ varittate.

153. Puṇḍarīka jyotiṣa 41. Ff. 1-14. 14 × 30 cm. Tables.

F. 1. Table of the mean motions of the Sun as on f. 5 of manuscript 152.

F. 1v. Table of the mean motions of the Moon as on f. 5v of manuscript 152.

F. 2. Table of the mean motions of the Moon's apogee as on f. 6 of manuscript 152.

F. 2v. Table of the mean motions of Rāhu as on f. 6v of manuscript 152.

F. 3. Table of the mean motions of Mars as on f. 7 of manuscript 152.

F. 3v. Table of the mean motions of Mercury's kendra as on f. 7v of manuscript 152.

F. 4. Table of the mean motions of Jupiter as on f. 8 of manuscript 152.

F. 4v. Table of the mean motions of Venus' kendra as on f. 8v of manuscript 152.

F. 5. Table of the mean motions of Saturn as on f. 9 of manuscript 152.

F. 5v. Table of the manda equation of the Sun as on f. 9v of manuscript 152.

F. 6. Table of the manda equation of the Moon as on f. 10 of manuscript 152.

Ff. 6v-7. Table of the manda equation of Mars as on f. 10v of manuscript 152.

Ff. 7-7v. Table of the manda equation of Mercury as on f. 11 of manuscript 152.

Ff. 7v-8v. Table of the manda equation of Jupiter as on f. 11v of Puṇḍarīka Jyotiṣa 36.

Ff. 8v-9. Table of the manda equation of Venus as on f. 12 of manuscript 152.

Ff. 9-9v. Table of the manda equation of Saturn as on f. 12v of manuscript 152.

Ff. 9v-11. Table of the śighra equation of Mars as on ff. 13-13v of manuscript 152.

Ff. 11-11v. Table of the śighra equation of Mercury as on ff. 14-14v of manuscript 152.

Ff. 11v-12v. Table of the śighra equation of Jupiter as on ff. 15-15v of manuscript 152.

Ff. 12v-13v. Table of the śighra equation of Venus as on ff. 16-16v of manuscript 152.

Ff. 13v-14. Table of the śighra equation of Saturn as on ff. 17-17v of manuscript 152.

F. 14v. Table of the elongations from the Sun required for the occurrence of the Greek-letter phenomena as on f. 18 of manuscript 152.

Colophon on f. 14v: iti śrī matsakalaganakasārvabhaumaśrī macchivaganakasutena

nīlakamṭhena viracitāyāṃ grahalāghavasāraṇyāṃ bhaumādipamcagrahaspaṣṭikaraṇaṃ sampūrṇatām āgamat.

After this is written:

sūryarkṣato starkṣam athodayarkṣam  
 khamadhyagarkṣam gaṇaye(t) krameṇa ||  
 hīnaṃ mahīltithya<sup>15hi8bhir</sup> niśārdha-  
 nighnaṃ nagāptaṃ niśi bhuktaghatyah || 1 ||  
 sūryarkṣād astabhaṃ sūryabhān  
 maulibhaṃ gaṇyaṃ saptahīnaṃ ca śeṣakaṃ ||  
 dviguṇaṃ dvayahīnaṃ ca  
 gatā rātriḥ sphuṭā bhavet ||1 ||

The **JAGADBHŪṢAṆA** completed by Haridatta under Jagatsiṃha of Mewar in 1638. *CESS* A6; *SATIUS* 55b–59b. The opening verses are:

praṇamyādidevaṃ vibhuṃ nārasimhaṃ  
 grahān bhāskarādyān gaṇeśaṃ bhavānīm |  
 graharkṣādītithyādīpañcāṅgasiddhyai  
 karomi prabandhaṃ jagadbhūṣaṇākhyam || 1 ||  
 devendras tridaśeṣu vṛkṣanicaye kalpadrumas tārakāsv  
 induḥ parvatasamcaye suragirī ratneṣu cintāmaṇiḥ |  
 gaṅgā satsaritāṃ gaṇe maragavī goṣu dvipānāṃ gaṇe  
 svarṇāgo 'khilarājayaṃśanikare śrīsūryayaṃśas tathā || 2 ||

#### Manuscripts:

154. Khasmohor 5083. Ff. 1–8. 11 × 27 cm. 14 lines. Verses only. Copied in 1741/2.

Colophon on ff. 8–8v: iti śrīgaṇakacakracūdāmaṇibhaṭṭaharajītanujahara-dattabha[f. 8v]ttaviracite niśalarājamāṇḍalīmaulamaṇḍitapratāpanikaravidhva-staripumamḥlavivadhavidyāvinodaraśīkamahārājādhirājamahārāṇāśrījagatsihanā-māṃkite

śrījagadbhūṣaṇe pañcāṃgaspaṭīkaraṇādhikāra pañcama 5.

After this is written:

gramthe smīn yad vilīkaṃ syāj jagadbhūṣaṇasaṃjñake  
 suddhībhiḥ sodhanīyaṃ tat suvicārya punaḥ punaḥ 1  
 pūṇatarkkaśarabhūmitaśake 1560 kārttike dhavalapakṣaśamete  
 pañcamitithiyute budhavāre bhūṣaṇaṃ samakarod dharattadaḥ 2  
 iti śrīmajagadbhūṣaṇa saṃpūrṇaḥ

Post-colophon: 1798.

155. Khasmohor 5349(b). 69 ff. 11 × 26 cm. Tables. Copied by Ṛṣaladāsa or Ṛṣalalāla Yati, the pupil of Lakṣmīcandra Vācaka, at Savāi Jayapura between ca. 15 February 1757 and ca. 20 June 1757. Incomplete.



Ff. (1-10). Table 1 of the *Jagadbhūṣaṇa* (Mars) for Śaka 1560 to 1717 (= A.D. 1638 to 1795).

Colophon on f. (10v): iti baumaspaṣṭaḥ samāptaḥ.

Post-colophon: li° ṛṣaladāsa gaṇiḥ.

Ff. (11-22). Table 2 of the *Jagadbhūṣaṇa* (Mercury) for Śaka 1560 to 1697 (= A.D. 1638 to 1775).

Colophon on f. (22): iti śrījagadbhūṣaṇau budhaḥ sapūrṇaḥ.

Post-colophon: savaījayapurame li° ṛṣalalālena yatinā matinā.

Ff. (22v-32v). Table 3 of the *Jagadbhūṣaṇa* (Jupiter) for Śaka 1560 to 1725 (= A.D. 1638 to 1803).

Colophon on f. (32v): iti śrījagadbhūṣaṇasāstre | guruḥ spaṣṭakoṣṭakāni sampūrṇāni jātāni.

Post-colophon: samvat 1813 varṣe kārttikamāse śuklapakṣe daśāmyām (as) au liṣitā ṛṣalalālena yatinā matinā | śrīsavāījayapuramadye.

Ff. (33-61). Table 4 of the *Jagadbhūṣaṇa* (Venus) for Śaka 1560 to 1785 (= A.D. 1638 to 1863).

Colophon on f. (61): iti śrījagadbhūṣaṇasāraṇyāyām śukraspaṣṭaḥ samāptaḥ.

Post-colophon: likhetam śrīsavāījayapuraganagaramadye | vācakottamaśrīśrī-lakṣmīcamdradaivajñatatsīṣyaṛṣaladāsena

yatinā | matinā | samvat 1813 varṣe mitī phāguṇa vadi 12 dine likhitā sāraṇī śubhā.

Ff. (61v-68v). Table 5 of the *Jagadbhūṣaṇa* (Saturn) for Śaka 1560 to 1677 (= A.D. 1638 to 1755).

Colophon on f. (68v): iti śrīmajjagadbhūṣaṇe śanispasto sampūrṇam.

Post-colophon: samvat 1814 varṣe mitī āṣāḍha śudī 4 dine likhitātra || riṇī caīṣā ṛṣaladāsena.

F. (69). Table 19 of the *Jagadbhūṣaṇa* (Rāhu) for 0 to 92 years.

Table 20 of the *Jagadbhūṣaṇa* (Rāhu) for 1 to 27 avadhis.

156. Khasmohor 5420. Ff. 1-7. 11 × 26.5 cm. 12 lines. Verses only. Copied on Wednesday 5 June 1771.

Colophon on f. 7v: iti śrīgaṇakacakracūdāmaṇibhaṭṭaśrīharaḥ | mahārā° paṃcama || 5 ||

After this is written:

gramthe smin yad vyalīkaṃ syā jagadbhūṣaṇasamjñake |  
sudhībhiḥ śodhanīyaṃ - - - rya puna naḥ || 1  
pūrṇatarka1060śarabhūmi - - - - dhavalapakṣasamite  
paṃcāmmīthiyute budhavāre bhūṣaṇam samakarod varadattaḥ || 1 || ||  
sampūrṇayaṃ jagadbhūṣaṇasamjñako pathaḥ || 1 ||

Post-colophon: samvat 1826 āśāḍe kṛṣṇe tithau 9 budhe lipīkṛtam.

157. Khasmohor 5014. Ff. 1-72. 12 × 28 cm.

F. 1v. Table of the mean motions of the epact, the lord of the year, the Moon, and the lunar anomaly for 20-year periods from Śaka 1520 to 1700 (= A.D. 1598 to 1778); cf. table 2 of the Anonymous of 1598 in *SATIUS* 55 a-b.

Table of the mean motions of the same entities for 1 to 20 years; cf. table 1 of the Anonymous of 1598 in *SATIUS* 55a.

F. 2. Table of the mean motions of the Moon and the lunar apogee for 1 to 60 ghaṭis; cf. table 14 of the *Jagadbhūṣaṇa*.

F. 2v. Tables 12 and 13 of the *Jagadbhūṣaṇa*.

Tables 10 and 11 of the *Jagadbhūṣaṇa*.

F. 3. Table of the lunar equations, their differences, the lunar velocities, and their differences for 1 to 30 intervals of 3°; cf. table 15 of the *Jagadbhūṣaṇa*.

Table of solar longitudes and velocities for 1 to 27 avadhis; cf. table 17 of the *Jagadbhūṣaṇa*.

F. 3v. Table 16 of the *Jagadbhūṣaṇa*.

Ff. 4-13v. Table 1 of the *Jagadbhūṣaṇa* (Mars) for Śaka 1560 to 1638 (= A.D. 1638 to 1716).

Ff. 14-25. Table 2 of the *Jagadbhūṣaṇa* (Mercury) for Śaka 1560 to 1605 (= A.D. 1638 to 1683).

Ff. 25v-35v. Table 3 of the *Jagadbhūṣaṇa* (Jupiter) for Śaka 1560 to 1642 (= A.D. 1638 to 1720).

Ff. 36-64. Table 4 of the *Jagadbhūṣaṇa* (Venus) for Śaka 1560 to 1786 (= A.D. 1638 to 1864).

Ff. 64v-71v. Table 5 of the *Jagadbhūṣaṇa* (Saturn) for Śaka 1560 to 1618 (= A.D. 1638 to 1696).

F. 72. Table 19 of the *Jagadbhūṣaṇa*.

Table 20 of the *Jagadbhūṣaṇa*.

Colophon on f. 72v: sārāṇi jagadbhūṣaṇakī.

Indication of price by another scribe: kī. 5||j.

158. Khasmohor 5050. Ff. 1-4 and 4b-71. 11 × 25 cm.

F. 1v. Table 7 of the *Jagadbhūṣaṇa* (epact) for 0 to 121 years.

F. 2. Table 6 of the *Jagadbhūṣaṇa* (lord of the year) for 0 to 88 years.

Ff. 2-2v. Table 8 of the *Jagadbhūṣaṇa* (Moon) for 0 to 122 years.

F. 2v. Table 9 of the *Jagadbhūṣaṇa* (lunar anomaly) for 0 to 42 years.

F. 3. Table of the mean motions of the Moon and the lunar anomaly for 1 to 60 ghaṭis; cf. table 14 of the *Jagadbhūṣaṇa*.

F. 3v. Table of the mean motions of the Moon and the lunar anomaly for 1 to 27 avadhis; cf. tables 10 and 11 of the *Jagadbhūṣaṇa*.

Table of the mean motions of the Moon and the lunar anomaly for 1 to 13 days; cf. tables 12 and 13 of the *Jagadbhūṣaṇa*.

F. 4. Table 15 of the *Jagadbhūṣaṇa* (lunar equation) for 0 to 30 intervals of 3°.

Table 17 of the *Jagadbhūṣaṇa* (Sun) for 1 to 27 avadhis

F. 4v. Table 16 of the *Jagadbhūṣaṇa* for 1 to 27 avadhis.

Ff. 4b-13. Table 1 of the *Jagadbhūṣaṇa* (Mars) for 0 to 78 years.

Ff. 14–25. Table 2 of the *Jagadbhūṣaṇa* (Mercury) for 0 to 45 years.  
 Ff. 25v–35v. Table 3 of the *Jagadbhūṣaṇa* (Jupiter) for 0 to 82 years.  
 Ff. 36–64. Table 4 of the *Jagadbhūṣaṇa* (Venus) for 0 to 226 years.  
 Ff. 64v–71v. Table 5 of the *Jagadbhūṣaṇa* (Saturn) for 0 to 58 years.  
 Colophon on f. 71v: iti śrījagadbhūṣaṇe śanispasta sampūrṇaḥ.

159. Khasmohor 5079. Ff. 1–88. 11.5 × 25.5 cm.

Ff. 1–14. Table 1 of the *Jagadbhūṣaṇa* (Mars) for 0 to 78 years; year 0 = Śaka 1560 (= A.D. 1638).

F. 1. At the bottom is written:

śāko bhūṣaṭtithibhi 1560 svagajaśvaraḥ cakre sya bhājito  
 śeṣaṃ tatpamktistho graho bhavet bhaumaspaṣṭaḥ  
 gaṇo bhaje cakre 14 vadhe pramāṇaṃ nagādhike lpe  
 dviyuk ṛnasthaṃ evaṃ prasādhyāḥ sphuṭacālakena  
 game svarṇaviparītacakre tātkālika raṇaḥ.

Ff. 14v–25v. Table 2 of the *Jagadbhūṣaṇa* (Mercury) for 0 to 45 years; year 0 = Śaka 1560 (= A.D. 1638).

Ff. 26–39v. Table 3 of the *Jagadbhūṣaṇa* (Jupiter) for 1 to 82 years; year 1 = Śaka 1643 (= A.D. 1721).

Ff. 40–77v. Table 4 of the *Jagadbhūṣaṇa* (Venus) for 0 to 227 years; year 0 = Śaka 1560 (= A.D. 1638).

Ff. 78–87v. Table 5 of the *Jagadbhūṣaṇa* (Saturn) for 0 to 58 years; year 0 = Śaka 1560 (= A.D. 1638).

F. 88. Table 19 of the *Jagadbhūṣaṇa* (lunar node) for 0 to 92 years; year 0 = Śaka 1560 (= A.D. 1638) or Śaka 1657 (= A.D. 1735).

Table 20 of the *Jagadbhūṣaṇa* (lunar node) for 1 to 27 avadhis.

F. 88v. Blank except for the title.

160. Khasmohor 5174(m). Ff. 1–5. 5174(b). Ff. 6–69. and 5174(s). F. 69, corrected to 70. 11 × 26 cm.

F. 1v. Table 6 of the *Jagadbhūṣaṇa* (lord of the year) for 0 to 88 years.

Ff. 2–2v. Table 7 of the *Jagadbhūṣaṇa* (epact) for 0 to 121 years.

Ff. 2v–3. Table 8 of the *Jagadbhūṣaṇa* (Moon) for 0 to 121 years.

Ff. 3–3v. Table 9 of the *Jagadbhūṣaṇa* (lunar anomaly) for 0 to 43 years.

F. 3v. Table 10 of the *Jagadbhūṣaṇa* (Moon) for 1 to 27 avadhis.

Ff. 3v–4. Table 11 of the *Jagadbhūṣaṇa* (lunar anomaly) for 1 to 27 avadhis.

F. 4. Table 12 of the *Jagadbhūṣaṇa* (Moon) for 1 to 13 days.

Table 13 of the *Jagadbhūṣaṇa* (lunar anomaly) for 1 to 13 days.

Ff. 4–4v. Table 14 of the *Jagadbhūṣaṇa* (Moon) for 1 to 60 ghaṭikās.

F. 4v. Table 15 of the *Jagadbhūṣaṇa* (Moon) for 1 to 30 sets of 3°.

F. 5. Combination of tables 16, 17, and 18 of the *Jagadbhūṣaṇa* for 1 to 27 avadhis.



Ff. 5v–15v. Table 1 of the *Jagadbhūṣaṇa* (Mars) for 0 to 78 years.  
 Ff. 16–23v. Table 2 of the *Jagadbhūṣaṇa* (Mercury) for 0 to 45 years.  
 Ff. 23v–34. Table 3 of the *Jagadbhūṣaṇa* (Jupiter) for 0 to 82 years.  
 Ff. 34–62. Table 4 of the *Jagadbhūṣaṇa* (Venus) for 0 to 226 years.  
 Ff. 63–70. Table 5 of the *Jagadbhūṣaṇa* (Saturn) for 0 to 58 years.  
 F. 70v. Table 19 of the *Jagadbhūṣaṇa* (lunar node) for 0 to 92 years.  
 Table 20 of the *Jagadbhūṣaṇa* (lunar node) for 1 to 27 avadhis.

161. Khasmohor 5174(l). F. 4. 11 × 26.5 cm. Incomplete.

F. 4. Table 12 of the *Jagadbhūṣaṇa* (Moon) for 1 to 13 days.

Table of lunar equations for 1 to 29; entry for 29 is that for 30 intervals of 3°: 5;2,10°.

Ff. 4–4v. Table 15 of the *Jagadbhūṣaṇa* (Moon) for 0 to 30 intervals of 3°.

F. 4v. Table 19 of the *Jagadbhūṣaṇa* (lunar node); incomplete (for 0 to 26 years).

The **JAGADBHŪṢAṆAKARTTAVYATĀ**. The first verse is:

madhor gatās te khaguṇair vinighnā  
 yuktās tithī nirgatasankhyakāni ||  
 śuddhyonitāḥ ṣaṣṭidināgahinā  
 gaṇo bhaved abdapateḥ sakāśāt || 1 ||

Manuscript:

162. Khasmohor 5349(c). Ff. (64v–65). 11 × 26 cm.

Colophon on f. (64v): iti jagadbhūṣaṇakarttavayatā samāptā.

F. (65). Table 19 of the *Jagadbhūṣaṇa* (lunar node); incomplete.

F. (65v). Blank.

Tables for 1638 and later years.

Manuscript:

163. Khasmohor 5015(b). Ff. 1–3. 12 × 28 cm.

Ff. 1–1v. Table of the epact for Śaka 1560 to 1706 (= A.D. 1638 to 1784).

Ff. 2–2v. Table of dhruvāṅkas of the Moon and the lunar anomaly for Śaka 1580 to 1680 (= A.D. 1658 to 1758).

Ff. 3–3v. Table of the lord of the year from Śaka 1620 to 1715 (= A.D. 1698 to 1793).

The **GRAHALĀGHAVASĀRINĪ** composed by Prema at Madhunagarī in 1656. CESS A4, 229a–229b, and A5, 226a. The first verse is:

natvā gaṇeśasya pādāravindaṃ  
 hariṃ ca sūryapramukhān grahāṃś ca ||  
 premo grahārthaṃ grahalāghavasya  
 laghukriyāṃ sārāṇikāṃ prakurve || 1 ||

#### Manuscripts:

164. Puṇḍarīka jyotiṣa 42. α. F. 1; and β. Ff. 1–14. 13 × 23.5 cm. 8 lines on α. Copied by Ṛddhinātha Vyāsa on Wednesday 5 May 1703 and on ca. 6 August 1703.

α. Ff. 1–1v. Verses.

Colophon on f. 1v: iti śrīvaṃśīrasūnumiśrapremaviracitāyāṃ grahalāghava-sāriṇyāṃ ślokaḥkramavivaraṇaṃ samāptam.

Post-colophon: saṃ 1760 jyesthasukla 1 budhe likhitaṃ vyāsa ṛddhināthe-nedaṃ pustakam.

β. F. 1. Tables of the mean motion of the Sun for 0 to 29 days, for 30 to 330 days in sets of 30, for 360 to 3960 days in sets of 360, and for 0 to 30 dhruvāṅkas of 4016 days each; the mean longitude of the Sun at dhruvāṅka 0 is that for 18 March 1520: 11° 19;41,0°.

F. 1v. Similar tables for the Moon; the mean longitude of the Moon at dhruvāṅka 0 is 11° 19;6,0°.

F. 2. Similar tables for the lunar apogee; the longitude of the lunar apogee at dhruvāṅka 0 is 5° 17;33,0°.

F. 2v. Similar tables for the lunar node; the longitude of the lunar node at dhruvāṅka 0 is 0° 27;38,0°.

F. 3. Similar tables for Mars; the mean longitude of Mars at dhruvāṅka 1 is 8° 11;36,0°; at dhruvāṅka 0, which is omitted, it would be 10° 7;8,0°.

F. 3v. Similar tables for Mercury's anomaly; the longitude of Mercury's anomaly at dhruvāṅka 1 is 4° 26;6,0°; at dhruvāṅka 0, which is omitted, it would be 9° 0;3,0°.

F. 4. Similar tables for Jupiter; the mean longitude of Jupiter at dhruvāṅka 0 is 7° 2;16,0°.

F. 4v. Similar tables for Venus' anomaly; the longitude of Venus' anomaly at dhruvāṅka 0 is 7° 20;9,0°.

F. 5. Similar tables for Saturn; the mean longitude of Saturn at dhruvāṅka 1 is 1° 29;39,0°; at dhruvāṅka 0, which is omitted, it would be 9° 15;20,0°.

F. 5v. Table of the equation of the center of the Sun and the equation of its velocity for 1° to 90°; the maximum is 2;10,45° at 90°.

F. 6. Table of the equation of the center of the Moon and the equation of its velocity for 1° to 90°; the maximum is 5;1,40° at 90°.

F. 6v. Table of the equation of the center of Mars and the equation of its velocity for 1° to 90°; the maximum is 13;0,0° at 90°.

F. 7. Table of the equation of the center of Mercury and the equation of its velocity for 1° to 90°; the maximum is 3;36,0° at 90°.

F. 7v. Table of the equation of the center of Jupiter and the equation of its velocity for  $1^\circ$  to  $90^\circ$ ; the maximum is  $5;42,0^\circ$  at  $90^\circ$ .

F. 8. Table of the equation of the center of Venus and the equation of its velocity for  $1^\circ$  to  $90^\circ$ ; the maximum is  $1;30,0^\circ$  at  $90^\circ$ .

F. 8v. Table of the equation of the center of Saturn and the equation of its velocity for  $1^\circ$  to  $90^\circ$ ; the maximum is  $9;18,0^\circ$  at  $90^\circ$ .

Ff. 9–9v. Table of the *śighra* equation of Mars and the equation of its velocity for  $1^\circ$  to  $180^\circ$ ; the maximum is  $40;0,0^\circ$  at  $135^\circ$ .

Ff. 10–10v. Table of the *śighra* equation of Mercury and the equation of its velocity for  $1^\circ$  to  $180^\circ$ ; the maximum is  $21;12,0^\circ$  at  $105^\circ$  to  $120^\circ$ .

Ff. 11–11v. Table of the *śighra* equation of Jupiter and the equation of its velocity for  $1^\circ$  to  $180^\circ$ ; the maximum is  $10;48,0^\circ$  at  $105^\circ$ .

Ff. 12–12v. Table of the *śighra* equation of Venus and the equation of its velocity for  $1^\circ$  to  $180^\circ$ ; the maximum is  $46;6,0^\circ$  at  $135^\circ$ .

Ff. 13–13v. Table of the *śighra* equation of Saturn and the equation of its velocity for  $1^\circ$  to  $180^\circ$ ; the maximum is  $5;42,0^\circ$  at  $90^\circ$  to  $105^\circ$ .

F. 14. Table of elongations from the Sun necessary for the occurrences of the Greek-letter phenomena of Mars, Mercury, Jupiter, Venus, and Saturn.

Ff. 14–14v. Explanatory text.

Date-formula on f. 14v: *saṃ 1760 śrā. śu 5 li° ṛddhinātha.*

165. Khasmohor 5596. Ff. 1–14.  $11.5 \times 26.5$  cm. 11 lines on f. 1.

Colophon to Prema's verses on f. 1: *iti grahalāghavasāraṇī mūlaś1.*

The mean motion tables in this manuscript are arranged differently from those in the preceding one. They are for 1 to 33 *dhruvāṅkas* (called *cakras*), 1 to 9 days (*ekasthāna*), 10 to 90 days in groups of 10 (*daśasthāna*), 100 to 900 days in groups of 100 (*śatasthāna*), and 1000 to 9000 days in groups of 1000 (*sa-hasrasthāna*). These are like the mean motion tables in the *Grahalāghavasāraṇī* ascribed to Nilakaṇṭha.

F. 1v. Table of the mean motions of the Sun.

F. 2. Table of the mean motions of the Moon.

F. 2v. Table of the motions of the lunar apogee.

F. 3. Table of the mean motions of Mars.

F. 3v. Table of the mean motions of Mercury's anomaly.

F. 4. Table of the mean motions of Jupiter.

F. 4v. Table of the mean motions of Venus' anomaly.

F. 5. Table of the mean motions of Saturn.

F. 5v. Table of the motions of the lunar node.

F. 6. Table of the equation of the center and the equation of its velocity of the Sun.

F. 6v. Table of the equation of the center and the equation of its velocity of the Moon.

F. 7. Table of the equation of the center and the equation of its velocity of Mars.



F. 7v. Table of the equation of the center and the equation of its velocity of Mercury.

F. 8. Table of the equation of the center and the equation of its velocity of Jupiter.

F. 8v. Table of the equation of the center and the equation of its velocity of Venus.

F. 9. Table of the equation of the center and the equation of its velocity of Saturn.

Ff. 9v-10. Table of the *śighra* equation and the equation of its velocity of Mars.

Ff. 10v-11. Table of the *śighra* equation and the equation of its velocity of Mercury.

Ff. 11v-12. Table of the *śighra* equation and the equation of its velocity of Jupiter.

Ff. 12v-13. Table of the *śighra* equation and the equation of its velocity of Venus.

Ff. 13v-14. Table of the *śighra* equation and the equation of its velocity of Saturn.

F. 14v. Blank.

The **JAGACCANDRIKĀ SĀRIṆĪ** composed by a Jaina; its epoch is 1668. The first verse is:

sakalasiddhidāyakaḥ saśararavisamatejavikhyāta ||  
aśvasenanaṁdana namuṁ te viśamā jinaprāta || 1 ||

Manuscript:

166. Khasmohor 5049(a). Ff. 41-55. 11 × 25 cm. 17 lines.

Colophon on f. 41v, after verse 37 of the instructions: *iti śrījagaccandrikā sārāṇīkarttavratā samāptā.*

F. 42. Table of the accumulated *adhimāsas*, *avamas*, *aharganas*, week-days, and lapsed years for the beginning of the years *Samvat* 1725, 1744, 1763, 1782, 1801, 1820, 1839, 1858, 1877, 1896, 1915, and 1934 (every 19 years from A.D. 1668 to 1877). The lapsed years of the *karāṇa* in 1668 were 485 so that the epoch was A.D. 1183, the epoch of Bhāskara's *Karāṇakutūhala*.

Table of the accumulated values of the same entities for 1 to 19 years.

Table of the same for 1 to 27 *pakṣas* beginning with the *kṛṣṇapakṣa* of *Caitra*.

F. 42v. Table of the half daylights at Nāgora, Āgorā, Ajamera, and Bīkānera, where the noon equinocital shadow is 6;0 digits. The Sun's longitudes are *sāyana*.

Ff. 43-43v. Table of the mean motions of the Sun, the Moon the lunar apogee, Mars, Mercury, Jupiter, Venus, Saturn, and Rāhu for *Samvat* 1725 to 1896 in intervals of 19 years and for 1 to 19 years.

Ff. 44–44v. Table of the mean motions of the same from Caitra to Caitra and the adhimāsa and for 1 to 15 days.

Ff. 45–45v. Table of the mean motions of the same for 0 to 59 ghaṭikās.

F. 46. Table of the equation of the center of the Sun and the equation of its velocity for  $0^\circ$  to  $90^\circ$ ; the maximum is  $2;10,54^\circ$  at  $90^\circ$ .

F. 46v. Table of the equation of the center of the Moon and the equation of its velocity for  $0^\circ$  to  $90^\circ$ ; the maximum is  $5;2,31^\circ$  at  $90^\circ$ .

F. 47. Table of the udayāntara of the Sun and the Moon for  $0^\circ$  to  $29^\circ$  horizontal, and 0/6 to 5/11 zodiacal signs vertical.

Ff. 47v–48. Table of the bhaumamandoccapaṣṭa for  $0^\circ$  to  $29^\circ$  horizontal, 0 to 11 zodiacal signs vertical.

F. 48v. Table of the equation of the center of Mars and the equation of its velocity for  $0^\circ$  to  $90^\circ$ ; the maximum is  $11;12,53^\circ$  at  $90^\circ$ .

Ff. 49–49v. Table of the śīghra equation and hypotenuse of Mars for  $0^\circ$  to  $180^\circ$ ; the maximum is  $41;17,59^\circ$  at  $130^\circ$ .

F. 50. Table of the equation of the center of Mercury and the equation of its velocity for  $0^\circ$  to  $90^\circ$ ; the maximum is  $6;3,38^\circ$  at  $90^\circ$ .

Ff. 50v–51. Table of the śīghra equation and hypotenuse of Mercury for  $0^\circ$  to  $180^\circ$ ; the maximum is  $21;36,58^\circ$  at  $110^\circ$ .

F. 51v. Table of the equation of the center of Jupiter and the equation of its velocity for  $0^\circ$  to  $90^\circ$ ; the maximum is  $5;15,47^\circ$  at  $90^\circ$ .

Ff. 52–52v. Table of the śīghra equation and hypotenuse of Jupiter for  $0^\circ$  to  $180^\circ$ ; the maximum is  $10;59,1^\circ$  at  $100^\circ$ .

F. 53. Table of the equation of the center of Venus and the equation of its velocity for  $0^\circ$  to  $90^\circ$ ; the maximum is  $1;31,50^\circ$  at  $90^\circ$ .

Ff. 53v–54. Table of the śīghra equation and hypotenuse of Venus for  $0^\circ$  to  $180^\circ$ ; the maximum is  $46;30,28^\circ$  at  $140^\circ$ .

F. 54v. Table of the equation of the center of Saturn and the equation of its velocity for  $0^\circ$  to  $90^\circ$ ; the maximum is  $7;38,55^\circ$  at  $90^\circ$ .

Ff. 55–55v. Table of the śīghra equation and hypotenuse of Saturn for  $0^\circ$  to  $180^\circ$ ; the maximum is  $6;10,7^\circ$  at  $100^\circ$ .

At the end of each table of the śīghra equation are noted the elongations of the planet from the Sun necessary for the occurrences of its Greek-letter phenomena.

Colophon on f. 55v: iti jagaccamḍrikā sārāṇī samāptā.

A table of the lord of the year for every year from Śaka 1600 to 1755 (= A.D. 1678 to 1833) following the Brāhmapakṣa.

Manuscript:

167. Khasmohor 5082(d). F. 1.  $11 \times 24$  cm.

On f. 1v, at the top, is written: brahmapakṣe samvat 1735 śā 1660 ta ārabhya varṣamuṣo nibījabdapah prativarṣe kṣime kṣepaka 1|15|31|17|17. The lord of the year in Śaka 1600 (= A.D. 1678) was 1;17,5,30.

**The ANONYMOUS OF 1679.**

Manuscript:

168. Khasmohor 5060.  $\alpha$  ff. 1-27;  $\beta$  ff. 1-24;  $\gamma$  ff. 1-24;  $\delta$  ff. 1-2;  $\epsilon$  ff. 1-3;  $\zeta$  ff. 1-4;  $\eta$  ff. 1-26; and  $\theta$  ff. 1-24. 16 x 30 cm.

For each planet twelve dhruvas are given in which are the planet's true longitudes, differences, and divisors for 0 to 365 days. Each dhruva begins at a different longitude, and after each dhruva are given the longitude at which each Greek-letter phenomenon occurs.

$\alpha$ . Ff. 1-27v. Dhruvas 1 to 12 for Venus.

$\beta$ . Ff. 1-24v. Dhruvas 1 to 12 for Jupiter.

$\gamma$ . Ff. 1-24v. Dhruvas 1 to 12 for Mercury.

$\delta$ . Ff. 1-2v. Table of the initial values for the lord of the year, the epact, the Moon, the lunar anomaly, Mars, Mercury, Jupiter, Venus, Saturn, and Rāhu for the years from Śaka 1601 to 1700 (= A.D. 1679 to 1778).

$\epsilon$ . Ff. 1-3v. Table of the true longitudes of the Sun, the solar velocity, the length of daylight (not filled in), the half-equation of daylight (not filled in), and the traikya for 0 to 365 days.

$\zeta$ . Ff. 1-2v. Table of the mean longitudes of the Moon and of the lunar anomaly for 0 to 365 days.

Ff. 3-4v. Table of the lunar equations, their differences, and the Moon's velocities for 0° 0' to 11° 29'.

$\eta$ . Ff. 1-26v. Dhruvas 1 to 12 of Mars.

$\theta$ . Ff. 1-24v. Dhruvas 1 to 12 of Saturn.

**The ANONYMOUS OF 1718, following the Brāhmapakṣa.**

Manuscript:

169. Khasmohor 5254(h). F. 1. 11.5 x 26.5 cm.

F. 1. Table of the lord of the year, the epact, and the lunar anomaly for Śaka 1640, 1660, 1680, 1700, 1720, 1740, 1760, 1780, and 1800 (= A.D. 1718 to 1878), and for 1 to 20 years.

F. 1v. Table of the longitudes of the Moon for the same times.

**The ANONYMOUS OF 1726, following the Brāhmapakṣa.**

Manuscript:

170. Khasmohor 5082(f). 1 f. 11 x 25.5 cm.

F. (1). Table of the epact for the beginning of every year from Śaka 1648 to 1695 (= A.D. 1726 to 1773).

Table of the lord of the year for the same.

F. (1v). Table of longitudes of the Moon for the beginnings of the same years.



Table of the lunar anomaly for the beginning of every year from Śaka 1648 to 1697 (= A.D. 1726 to 1775).

The **PAÑCĀNGASĀRIṆĪ** composed in 30 verses by Kevalarāma at Ja-yapura in 1735. *CESS* A6. The first verse is:

varadāyakam nikhilavighnavārakam  
 gaṇanāyakam ruciracandraabhākam ||  
 aghahārakam śaraṇagaikapālakam  
 praṇamāmi tam smararahasya bālakam || 1 ||

Manuscripts:

171. Puṇḍarīka jyotiṣa 48. Ff. 1-2 and (3). 12 × 26 cm. 12 lines. With marginalia. Copied by Gokula on Wednesday 3 April 1793.

Colophon of f. (3): iti śrījyotiṣarāyakevalarāmakṛtā pañcāṅgasāraṇī.

Post-colophon: likhitā gokulena madhau asitapakṣe ṣaṣṭyāṁ iṇḍusute sam-vat 1850.

F. (3v). Blank.

172. Puṇḍarīka jyotiṣa 47. Ff. 1-3. 13 × 27.5 cm. 10 lines. With marginalia. Copied by Gokulanātha (the same scribe as Gokula of the manuscript Puṇḍarīka jyotiṣa 48) on Sunday 28 April 1793.

Colophon on f. 3v: iti śrījyotiṣarāyakevalarāmakṛtā pañcāṅgasāraṇī.

Post-colophon: likhitā gokulanāthena vaiśākhakṛṣṇe dvitīyāyāṁ ravau sam 1850.

**A SŪRYASIDDHĀNTASĀRIṆĪ** whose epoch is 1743.

Manuscript:

173. Khasmohor 5174(n). Ff. 1-4. 11 × 26 cm.

F. 1. Table of the values of the lord of the year, the epact, the mean Moon, the lunar apogee, and the lunar node at the beginnings of Śaka 1665, 1685, 1705, 1725, 1745, and 1765 (= A.D. 1743 to 1843) and for 1 to 20 years.

F. 1v. Table of the mean longitudes of Mars, Mercury, Jupiter, Venus, and Saturn at the same times.

Ff. 2-2v. Table of the mean motions of each of the above mentioned for 1 to 12 months, 1 to 4 periods of 6 days, and for 1 to 5 days.

Ff. 3-3v. Table of the equations of the centers of the Sun, the Moon, Mars, Mercury, Jupiter, Venus, Saturn, and their differences for 0 to 30 intervals of 3°; their maxima, at 90°, are 2:11° for the Sun, 5:2.41° for the Moon, 11:37.49° for Mars, 4:28° for Mercury, 5:6° for Jupiter, 1:45° for Venus, and 7:49° for Saturn.

Ff. 4-4v. Table of the *śighra* equations of Mars, Mercury, Jupiter, Venus, and Saturn for 1 to 30 intervals  $6^\circ$ ; the maxima are  $40;16^\circ$  for Mars at  $22=132^\circ$ ,  $21;31^\circ$  for Mercury at  $19=114^\circ$ ,  $11;31^\circ$  for Jupiter at  $17=102^\circ$ ,  $46;21^\circ$  for Venus at  $23=138^\circ$ , and  $6;22^\circ$  for Saturn at  $16=96^\circ$ .

F. 4v. Table of the longitudes of the apogees of the Sun, Mars, Mercury, Jupiter, Venus, and Saturn.

Table of the elongations from the Sun of the five star-planets necessary for the occurrences of their first and second stations.

Table of the mean daily motions expressed in minutes and seconds of the Sun, the Moon, the lunar apogee, the lunar node, Mars, Mercury's *śighra*, Jupiter, Venus' *śighra*, and Saturn.

A tithi, nakṣatra, and yoga table whose epoch is 1747.

Manuscript

174. Khasmohor 5254(b). Ff. 1-23; and 1 blank f.  $11.5 \times 26.5$  cm.

F. 1v. Tables of tithis, kendras, and an unidentified function for Śaka 1669 to 1797 (= A.D. 1747 to 1875) at intervals of 16 years, and for 1 to 16 years.

Tables of nakṣatras and yogas for Śaka 1669 to 1789 (= A.D. 1747 to 1867) at intervals of 24 years, and for 1 to 24 years.

F. 2. Table of the beginnings of the quarters of the 28 nakṣatras.

F. 2v. Table of the days of the Sun's entry into each of the 12 zodiacal signs and into each of the 29(!) nakṣatras.

Ff. 3-7v. Table of tithis for 0 to 27 horizontal and 0 to 27 vertical.

Ff. 8-8v. Table of tithis for 1 to 28 horizontal and 1 to 13 months vertical.

Ff. 9-9v. Table of equations of the tithis for 0 to 27 horizontal and 1 to 13 vertical.

Ff. 10-14v. Table of nakṣatras for 0 to 27 horizontal and 0 to 27 vertical.

Ff. 15-15v. Table of nakṣatras for 1 to 28 horizontal and 1 to 13 months vertical.

Ff. 16-16v. Table of equations of the nakṣatras for 0 to 27 horizontal and 1 to 13 vertical.

Ff. 17-21v. Table of yogas for 0 to 29 horizontal and 1 to 29 vertical.

Ff. 22-22v. Table of yogas for 1 to 30 horizontal and 1 to 13 months vertical.

Ff. 23-23v. Table of equations of the yogas for 1 to 29 horizontal and 1 to 13 vertical.

The **SŪRYASIDDHĀNTASĀRIṆĪ** or **GRAHASPAṢṬASĀRIṆĪ** in 21 verses composed by Candrāyaṇa at Mulatāna in 1748. See *CESS* A3, 46a, and A5, 109a. The first verse is:

natvārkaṃ sūryasiddhāntasaṃsiddhagrahasāraṇī ||  
candrāyaṇena kriyate gaṇitakleśahāriṇī ||

## Manuscripts:

175. Khasmohor 5250. 1 f.; and 1 blank f. 11 × 26 cm. 17 lines. Copied by Tejabhāna on Thursday 11 May 1769.

Colophon on f. 1: iti grahaspaṣṭasā(ṛaṇī).

Post-colophon entirely in margin: (saṃvat 1826 vaiśākha sudi 6 gurau tejabhānena lipteyam).

F. 1v. Blank.

176. Khasmohor 5495(a). F. 1. 10.5 × 26.5 cm. 10–13 lines. Copied by Sūrjabhāna on Wednesday 30 August 1769.

Colophon on f. 1v: iti śrīgrahaspaṣṭasāraṇī.

Post-colophon: saṃ 1826 bhādrapavādavadi 14 budhavāre sūrjabhānena likhitā sāraṇī.

177. Khasmohor 5495(b). 1 f. 10.5 × 26.5 cm. 3 lines. Incomplete. On the verso is patra 4 of Saturn's śīghraphala.

The **TITHIKALPAVRKṢA** composed by Candrāyaṇa in 11 verses. See *CESS* A3, 46a, and A5, 109a. The first verse is:

natvā gaṇeśasya padāravindam  
śrīkrṣṇadevasya guroś ca mūrdhnā |  
budhvā hi sauram tithikalpavrkṣam  
pañcāṅgapatrāśubhavāyu kurve ||

## Manuscript:

178. Khasmohor 5251. 1 f. 11 × 26 cm. 9 lines. With marginal notes. Copied by Sūrjabhāna on Friday 1 September 1769.

Colophon on f. 1v: iti śrīcandrāyaṇadaivajñaviracitas tithikalpavrkṣaḥ.

Post-colophon: saṃ° 1826 bhādrasudi 1 śukre likhitam sūrjabhānena.

Table unfilled in of Mercury's equation of the center according to the *Karaṇakutūhala* of Bhāskara and dated Śaka 1674 (= A.D. 1752).

## Manuscript:

179. Khasmohor 5174(c). F. 3. 12.5 × 26 cm.

Obverse and recto: skeleton of a table. The title of the table on the reverse is: vudhādīnā maṃdaphalakhaṃdāni.



At the top of the reverse is written: śakaḥ 1674 gatābde pīṇḍaḥ 569. Śaka 1674 diminished by 596 is Śaka 1105 (= A.D. 1183), the epoch of Bhāskara's *Karaṇakutūhala*.

The **LAGHUTITHICINTĀMAṆI** composed by Nandarāma Miśra at Kāmavana in 1777. See *CESS* A5, 158a. The first verse is:

haripadam abhivandya viśvāhetos  
tithimukhasiddhipataṃ tanomi samyak |  
kṛtaṃ api makarandapūrvavijñair  
na milati samprati kāladeśabhedāt ||

Manuscript:

180. Khasmohor 5574. Ff. 1-8. 12 × 26.5 cm. 12 lines. Instructions only. Colophon on f. 8v: iti śrīmirśraṇḍarāmaviracite (corr. to viracito) laghu-cintāmaṇiḥ.

A **GRAHALĀGHAVAKARTTAVYATĀ** in Hindī. It begins: tatrāḍau mūlasūtrānusāreṇa śuddāharganaḥ sādhyah.

Manuscript:

181. Khasmohor 5504(a). Ff. 1 and 11 (f. 11 also numbered 59 on the verso). 10.5 × 24.5 cm. 17 lines. Incomplete. Copied at Saṅgrāmapura on Tuesday 27 March 1716.

F. 1v ends: jo keṇḍrarāśi ghāmai 6|7|8|9|10(|11).

F. 11 begins with a table of Saturn's śighra equation with the entries for arguments from 151 to 180; for 151 the equation is 3;12.0°.

Colophon after this table: iti śrīgrahalāghavakī sāraṇī saṃpūrṇā.

Post-colophon: saṃvat 1773 varṣe | vaiśākhakṛṣṇapratiṭṭithau | bhauma-vāre likhitam | śrisaṅgrāmapuramādhye.

Below this are 5 lines of text and another colophon: iti grahalāghavasāraṇī-karttavyatā saṃpūrṇā.

There follows a table of the motions in 7 days and the yearly motions of the Sun, the Moon, the lunar apogee, the lunar node, Mars, Mercury, Jupiter, Venus, and Saturn, and the lord of the year.

Table of the lord of the year for 1 to 120 years with the parameter of Gaṇeśa's *Grahalāghava*.

Manuscript:

182. Khasmohor 5174(u). F. 2. The yearly parameter is 1;15,31,30 days.

A set of calendrical and planetary tables

Manuscript:

183. Khasmohor 5353(b). Ff. 3–10. 11 × 25 cm. Incomplete.

Ff. 3–3v. Tables of annual motions, epoch positions, dhruvāṅkas without Rāmabījas, Rāmabījas, and dhruvāṅkas with Rāmabījas of the epact, the lord of the year, Mars, Mercury, Jupiter, Venus, Saturn, and the lunar node. Unfortunately, no numerical entries were recorded for this manuscript.

F. 4. Tables of the epact for 0 to 9, 10 to 90 in steps of 10, and 100 to 900 in steps of 100 years.

Ff. 4–4v. Tables of the lord of the year according to the same arrangement.

F. 4v. Tables of Mars according to the same arrangement.

Tables of Mercury according to the same arrangement.

Ff. 4v–5. Tables of Jupiter according to the same arrangement.

F. 5. Tables of Venus according to the same arrangement.

Tables of Saturn according to the same arrangement.

Tables of the lunar node according to the same arrangement.

No descriptions were recorded of ff. 5v–7 and 8–9.

F. 7v. Tables of the longitudes of the lunar node for 0 to 27 avadhīs.

Ff. 9v–10v. Table of koṣṭhakākṣepāḥ for 0 to 365 days.

A set of planetary tables consisting of a “saurabha” of each planet for 0 to 59.

Manuscript:

184. Khasmohor 5174(i). Ff. (1) and 2–3. 11.5 × 25 cm.

F. (1). Ravisaurabha.

(Candrasaurabha).

F. (1v). Bhaumasaurabha.

F. 2. Budhasaurabha.

F. 2v. Gurusaurabha.

F. 3. Bhṛgu(saurabha).

F. 3v. Śani(saurabha).

For the Sun there is 1 column, perhaps relating to true longitude; for the Moon 2 columns, perhaps relating to mean longitude and the equation; and for the five star-planets 3 columns each, perhaps relating to mean longitude and the 2 equations.

A set of tables of the planets’ longitudes set up like those of Mahādeva’s *Mahādevī*.

Manuscript:

185. Khasmohor 5253(b). Ff. 17–69. 11 × 26 cm. Incomplete.

F. 17. Mars for N=58-59.

Ff. 17v-47. Mercury for N=0-59.

Ff. 47v-62. Jupiter for N=0-59.

Ff. 62v-69v. Venus for N=0-29.

Table of the longitudes of the lunar node for 0 to 100 years and for years 61 to 77.

Manuscript:

186. Khasmohor 5174(w). F. 1. 11 × 26 cm. The epoch longitude is 8° 22;52,40°.

Tithi, nakṣatra, and yoga tables.

Manuscript:

187. Khasmohor 5520. Ff. 2 and 4. 11.5 × 26 cm. Incomplete.

F. 2. Blank.

F. 2v. Tithi table with 4 variables; for 0 to 26 horizontally.

F. 4. Price mark: kī ५१.

F. 4v. Table of two functions—vārādi and vallī—from 63 to 125 horizontal.

A table in Hindī relating to tithis 8 and 0 of the kṛṣṇapakṣa and tithis 8 and 15 of the śuklapakṣa of āsāḍha, śrāvaṇa, bhādravā, āsu, kātī, magasira, poha, māha, phāguṇa, caitra, vaiśāṣa, jetha, āsāḍha, śrāvaṇa, bhādravā, āsū, kātī, magasira, posa, māha phāguṇa, caitra, vaiśāṣa, and jetha.

Manuscript:

188. Khasmohor 5082(g). 1 f. 25.5 × 10.5 cm. Torn at the top.

A sāyanalagnasāriṇī for a latitude where the noon equinoctial shadow is 6;6 ( $\phi=26;57^\circ$ ).

Manuscript:

189. Puṇḍarika jyotiṣa 46. 1 blank f. and ff. 1-2. 12 × 26 cm. Copied by Gokulanātha Joṣī on Friday 14, 21, 28 November, or 5 or 12 December 1788.

Ff. 1-2v. The table is for 0 to 29° horizontal and 0 to 11 zodiacal signs vertical.

Date-formula on f. 2v: likhitā iyaṃ joṣī gokulanāthena āgrahāyaṇike māsi śukre saṃvat 1845 śāke 1710.



A sāyanalagnapatra for Lavapura, where the noon equinoctial shadow is 7;30 ( $\phi=32;0^\circ$ ) and the deśāntara is 35 yojanas.

Manuscript:

190. Khasmohor 5174(r). 1 f. 11 × 26.5 cm.

A nirayanalagnasāraṇī for Mūlatrāṇa. The entry is 0;0,0 at 11° 10' so that the precession amounts to 20°; this indicates a date of about 1840.

Manuscript:

191. Khasmohor 5254(d). Ff. 1-1v. 11.5 × 26.5 cm.

A nirayanalagnapatra. The entry for 0° 0' is 2;11.

Manuscript:

192. Khasmohor 5349(d). 1 f. 11 × 26 cm.

A nirayanalagnasāraṇī for Jayapura, where the noon equinoctial shadow is 6;6 ( $\phi=26;57^\circ$ ); the precession is 21;21°, which indicates a date of about 1900.

Manuscript:

193. Puṇḍarīka jyotiṣa 43(a). 2 ff. 10 × 21.5 cm.

Ff. (1-1v). Nirayanalagnasāraṇī.

Ff. (2-2v). Table of the lords of the year, the nakṣatras, and the tithis for 1 to 100 years. The yearly parameter for the lord of the year is that of the *Grahalāghava*, 1;15,31,30 days.

Below this is written:

tigmāṇṣuśukraśaniśukrasurejyacaṇḍrāḥ  
śaśāṇkabhaumaśanibhaumasurejyacaṇḍrāḥ ||  
devejyaśītakiraṇemdujabhūmiputrāḥ  
sūryośanaḥśanisitārkiḥkujejyacaṇḍrāḥ ||

A nirayanalagnasāraṇī for a locality where the noon equinoctial shadow is 6;6 ( $\phi=26;57^\circ$ ).

Manuscript:

194. Puṇḍarīka jyotiṣa 44(e). Ff. 1-2. 10 × 21.5 cm.

A table of the ascendants and midheavens for 0 to 29° horizontal and four zodiacal signs (Cancer to Libra?) vertical.

## Manuscript:

195. Khasmohor 5082(b). 1 f. 10.5 × 25.5 cm. Incomplete.

First sign, 0°: ascendent 3° 6;3,58, midheaven 11° 29;57,36°.

Fourth sign, 28°: ascendent 6° 23;6,48°, midheaven 3° 24;7,26° (the ascendent for fourth sign, 29°, is not entered).

A table of the fourth bhāva.

## Manuscript:

196. Khasmohor 5174(q). F. 1. 11 × 26.5 cm.

A table for the fourth and tenth bhāvas. The precession is stated to be 20°, which indicates a date of about 1840.

## Manuscript:

197. Khasmohor 5504(b). 1 f. 11 × 25.5 cm.

A table of the tenth bhāva.

## Manuscript:

198. Khasmohor 5254(f). 1 f. 11.5 × 26.5 cm.

A table of the cusps of the tenth bhāva as each of the 28 nakṣatras is in the ascendent. Composed by Viśveśvara in about 1790/1800 at Jayapura for Pratāpasimha. See *CESS* A5, 700b–701b.

## Manuscript:

199. Puṇḍarīka jyotiṣa 44(g). 2 ff. 10 × 21.5 cm.

Ff. (1–1v). A text in 4 verses. It begins:

arkāṇśaiḥ pramitaṃ śasāṃkabhavanam dāsre khamadhyasthite  
yāmye tryaśvimitair atho taraṇibhaṃ tarkāṃśakair vahnibhe ||  
śailābjaiś ca khabhe 'tha sūnyalavayuk vānyā mṛge rudrabhe  
vedāṃśair aditau gajāśvibhir atho puṣye tulāsaṃjñakam || 1 ||

It ends on f. (1v):

itthaṃ drksamatām vilokya katavām(?) śrīmatpratāpājñayā  
dāsrādu ca khamadhyage jayapure viśveśvaro veśmakam || 4 ||

See Puṇḍarīka jyotiṣa 9, f. A (manuscript 234).

F. (1v). Table of the cusps of the tenth bhāva when each of the 28 nakṣatras is in the ascendent.

Ff. (2-2v) blank.

A table of the length of daylight at Mūlātrāṇa.

Manuscript:

200. Khasmohor 5174(d). F. 1. 10.5 × 25 cm. The maximum is 34;56 ghaṭikās when the Sun is at Gemini 9°(sic!), the minimum is 25;2 ghaṭikās at Sagittarius 10°. The precession is 20°, indicating a date of about 1840.

A table of half the length of daylight.

Manuscript:

201. Khasmohor 5254(c). F. 1. 11.5 × 26.5 cm. The maximum is 17;29 ghaṭikās when the Sun is at Gemini 10°, the minimum is 12;31 ghaṭikās at Sagittarius 10°. The scheme, then, is virtually identical to that in Khasmohor 5174(d) (manuscript 200).

A table of Sines for 1 ° to 90°; R=60.

Manuscript:

202. Khasmohor 5481. 1 f. 15 × 32.5 cm.

A table of the shadows of a gnomon 12 digits in height when the Sun has altitudes of 1° to 90°; this is a table of Cotangents with R=12.

Manuscript:

203. Khasmohor 5480. 1 f. 15 × 33 cm.

A table of the altitude of the Sun for 1 to 15 ghaṭikās on the equinoctial days and the lengths of the shadows cast by a 12-digit gnomon. The noon equinoctial shadow is 6;6 ( $\phi=26;57^\circ$ ).

Manuscript:

204. Puṇḍarīka jyotiṣa 44(f). Ff. 1-(2). 10 × 21.5 cm.



A table of the reversed shadow for  $0^\circ$  to  $90^\circ$ . This is equivalent to a Tangent table with  $R=3438$ .

Manuscript:

205. Khasmohor 5479. 1 f.  $14.5 \times 28$  cm.

Tables of unidentified functions.

Manuscripts:

206. Khasmohor 5174(a). F. 1.  $11 \times 26$  cm. Table of a function with differences for an argument of 0 to 59. The entry for 1 and 59 is 6.33; the maximum is 100.0, the entry for 30.

207. Khasmohor 5174(f). 1 f.  $11 \times 27$  cm. The argument was 1 to 12 vertical and 0 to 27 horizontal; only the first 3 lines on the recto are filled in. The entries range from +0.27 to -2.40; the entry for 27 in line 3 is 0.0.

208. Khasmohor 5174(o). 1 f.  $10.5 \times 24.5$  cm.

F. (1). Table for 1 to 60; the entries do not have a common difference. The entry for 1 is 11.14.6.44.13.48; that for 60 is 12.36.4.2.40.48.

F. (1v). A similar table, but entries are given only for arguments from 1 to 30. The entry for 1 is 10.48.18.40.12; that for 30 is 24.9.20.6.0.

**E. ECLIPSES**

The **DHĪKOṬIDAKARAṆA** composed by Śrīpati in 1038. See *CESS* A6. Edited by K. S. Shukla, Lucknow 1969. The first verse is:

natvā bhavānīcaraṇāravindam  
śivam gaṇeśam druhiṇam girām ca |  
hariṁ gurum sadgrahaṇam raveś ca  
candrasya vakṣye sugamaparakāram ||

**Manuscripts:**

209. Puṇḍarīka jyotiṣa 27. Ff. 1–3. 11.5 × 23.5 cm. 9 lines. Copied by Śrīnātha on Thursday 30 August 1632.

F. 1v begins with 1,2a (p. 6,9): caṇḍrāṃganamdo96lṇaśako.

Colophon on f. 3: iti raviparvādhikārah.

Post-colophon: samvat 1689 āśvanavadi 10 daśamyām gurau likhitam śrī-nātha.

F. 3v. Blank.

210. Khasmohor 5129. Ff. 1–(2). 11 × 24.5 cm. 9 lines. Presented as one unified text with 19 verses.

F. 1 begins in 1,2a (p. 6,9): caṇḍrāṃganamdo96lṇaśako.

Colophon on f. (2): iti śrīśrīpatibhaṭṭaviracite dvikoṭināmā karanam samāptam iti.

F. (2v). Blank.

211. Khasmohor 5300. Ff. 1–3. Dimensions not recorded. 9 lines.

F. 1v begins in 1,2a (p. 6,9): caṇḍrāṃganamdo96lṇaśako.

Colophon on ff. 2v–3: iti śrīśrīpatibhaṭṭavira[f. 3]citam caṇḍrasūryayor graha-  
ṇajñānam.

Price on f. 3v: kīmati S|||.

The **CHĀDIKANIRṆAYA** composed by Kṛṣṇa in ca. 1600. See *CESS* A2, 51a; A4, 58a; and A5, 49a–49b. The first verse is:

guror viṣṇunāmnah padāmbhogayugmam  
praṇamyāntarāyātadhīvrddhikāri |  
niśānāthaghasreśayoś chādakasya  
grahe nirṇayam vaktum icchām karomi ||

## Manuscript:

212. Puṇḍarīka jyotiṣa 7. Ff. 1–6. 10 × 23 cm. 12 lines. Formerly property of Viśveśvara, the son of Rāmeśvara.

Colophon on f. 6v: iti śrīśakalagaṇakasārvabhaumaballālaganākātmaṣṇa-daivajñaviracitaḥ chāḍakanirṇayaḥ sampūrṇaḥ.

Ownership note on f. 1:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
chāḍakanirṇayapustam jagaj jñātv idaṁ śubham || 1 ||

Tables for computing eclipses.

## Manuscript:

213. Puṇḍarīka jyotiṣa 44(c). Ff. 1–14. 10.5 × 21.5 cm.

Ff. 1–3v. Table of the corrected longitudes of the Sun for each degree of its mean longitude, its daily motions, the differences in its equation, and its caras.

Ff. 4–6v. A similar table for the Moon with the differences in the daily motions substituted for the Sun's caras.

Ff. 7–9v. Table of deflections (valanāṅghrayaḥ) for lunar eclipses in the western hemisphere and for solar eclipses in the eastern hemisphere.

Ff. 10–12v. Table of deflections (valanāṅghrayaḥ) for lunar eclipses in the eastern hemisphere and solar eclipses in the western hemisphere.

F. 13. Table of lunar latitudes.

Ff. 13v–14v. Table of dr̥kkarmāṇi.

A set of eclipse tables.

## Manuscript:

214. Puṇḍarīka jyotiṣa 44(d). Ff. 1–2. 10.5 × 21.5 cm.

Ff. 1–2. Table of the diameters of the lunar disk measured in digits for daily motions from 722;20 (=12;2.20°) to 858;50 (=14;18.50°).

F. 2. Table of the diameters of the solar disk measured in digits for daily motions from 0;56.53° to 1;1.22°

F. 2v. Table of lunar latitudes measured in aṅgulas.

A GRAHAṆAMĀLĀ giving details of solar and lunar eclipses between Wednesday 15 śuklapakṣa of Pauṣa in Saṃ 1796 = 16 January 1740 and Monday 15 śuklapakṣa of Kārttika in Saṃ 1846 = 16 November 1789.

## Manuscript:

215. Puṇḍarīka jyotiṣa 272. Ff. 1–5. 10 × 21 cm. 13/14 lines. Only the versos of the folia written upon.

On f. 2 a second scribe has written:



śrīrāmajīśahāya || śrīvāgīśvarī jayati ||  
vāmadevo mahādevo virūpākṣas trilocanaḥ ||  
kṛṣānu.

Observation reports of eclipses.

Manuscripts:

216. Khasmohor 4876. 1 f. 119 × 42.5 cm. 45 lines. Torn. With a diagram of a lunar eclipse in blue and yellow. The first verse is:

sa jayati sindhuravadano  
devo yatpādapaṃkajasmarāṇaṃ |  
vāsaramaṇir iva tamasāṃ  
rāṣiṃ nāśayati vighnānām || 1 ||

It computes a lunar eclipse that was observed at 52:46 ghaṭikās of Monday 15 śuklapakṣa of Vaiśākha in Saṃ. (1818), Śaka 1683 = 18 May 1761.

217. Khasmohor 5178. 1 f. 94 × 22 cm.

Recto: computation according to the *Brahmatulya* of a lunar eclipse at 38:59 ghaṭikās on Friday 14 śuklapakṣa of Caitra in Saṃ. 1829, Śaka 1694 = 17 April 1772.

Verso: computation according to the *Brahmapakṣa* of a solar eclipse at 9:28 ghaṭikās on Tuesday 30 kṛṣṇapakṣa of Caitra in Saṃ. 1829, Śaka 1694 = 23 March 1773.

218. Khasmohor 5246. 3 ff. Each has a diagram of its eclipse.

F. (1). 36 × 25.5 cm. 11 lines. Computation according to the *Brahmatulya* of a lunar eclipse on Thursday 15 śuklapakṣa of Āśvina in Saṃ. 1830, Śaka 1695 = 30 September 1773.

F. (2). 26.5 × 21.5 cm. 13 lines. Computation according to the *Brahmatulya* of a lunar eclipse on Wednesday 15 śuklapakṣa of Māgha in Saṃ. 1831, Śaka 1696 = 15 February 1775.

F. (3). 26.5 × 21.5 cm. 5 lines. Computation according to the *Brahmatulya* of a solar eclipse on Tuesday 30 kṛṣṇapakṣa of Caitra in Saṃ. 1829, Śaka 1694 = 23 March 1773.

219. Khasmohor 4877. 1 f. 61 × 43 cm. In two columns. With a diagram of the eclipse.

Column 1: computation according to the *Grahalāghava* of a lunar eclipse at 8:54 ghaṭikās on Monday 14 śuklapakṣa of Māgha in Saṃ. 1916, Śaka 1781 = 5 February 1860.

Column 2: on what measures to take to avoid dire consequences.

220. Khasmohor 4878. 1 f. 60.5 × 44 cm. The first verse is:

yam brahmadevāṃtavido vadamti  
param pradhānam puruṣam tathānye ||  
viśvodgatesh kāraṇam īśvaram vā  
tasmai namo vighnavināśanāya || 1 ||

Copied by Choṭelāla.

Computation according to the *Brahmatulya* of a lunar eclipse at 3;20 ghaṭikās on Tuesday 15 śuklapakṣa of Māgha in Saṃ. 1916, Śaka 1781 = 6 February 1860. At the end is the verse:

śāstrānusāreṇa mayā lipikṛtam agre samyag  
īśvaro śrīśivo vetty alam || choṭelālena viduṣā likhyate parvvapa-  
trikā ||

### F. STAR CHARTS

A star chart made for Mahārāja Mādhavasimha (who ruled Jayapura from 1751 to 1768) according to a verse in its middle:

jayati yantram idam jhaṭiti sphuṭam  
 diśati darśanato 'sya niśāgatam ||  
 tanunṛpāspadapatnisukhānvitam  
 nṛpatimādhavasimhavinirmitam ||

It is accompanied by two set of tables.

Manuscript:

221. Khasmohor 1257. There are three parts.

(2). The chart. 1 piece of starched cloth. 73.5 × 76.5 cm. Attached to the center is a red silk thread with a red and green silk tassel, which acts as an index.

There are four concentric circles. The outermost, labelled ghaṭijñānārtham, is numbered at equal intervals from 1 to 60 ghaṭikās, and each ghaṭikā is divided into 6 equal parts each equivalent to 10 vighaṭikās or palas.

The next circle, labelled sūryādīnām saptamabhāvajñānam, is divided into 12 zodiacal signs, with zero at 18:50 ghaṭikās (=113 time-degrees). Also units of 6° are marked and single degrees. It is used for determining the descendent.

The next circle, labelled daśamacaturthayor jñānam, is marked similarly to the second circle, except that zero is at 3:10 ghaṭikās (=19 time-degrees). It is used for determining the cusps of the fourth and tenth places.

The innermost circle, labelled lagnajñānam, is marked similarly to the second and third circles, except that zero is at 47:30 ghaṭikās (=285 time-degrees). It is used for determining the ascendent.

Below the central verse are two columns listing the altitudes in degrees (un-natāṃśas) and meridian-distances in ghaṭikās (nataghaṭis) of 21 stars for each integer number of ghaṭikās and the maximum number of ghaṭikās and palas between the horizon and meridian. The twenty-one stars and the maximum meridian-distance of each are (the pala numbers are difficult to decipher and may be erroneous):

Aśvinī:	16:41.
Rohiṇī:	16:24.
Ārdrā:	15:30.
Punarvasu:	17:41.
Maghā:	16:21.
Pūrvā Phālgunī:	16:40.
Uttarā Phālgunī:	16:24.
Citrā:	14:10.
Svāti:	16:44.



Viśakhā:	13:30.
Anurādhā:	13:4.
Jyestha:	12:48.
Abhijit:	18:40.
Śravaṇa:	15:45.
Pūrvā Bhādrapadā:	17:29.
Uttarā Bhādrapadā:	17:47.
Prajapati:	20:6.
Brahmahṛdaya:	20:16.
Lubdhaka:	13:41.
Matsyamukha:	12:4.
Kukkuṭapuccha:	20:0.

On the outer periphery of the outermost circle are marked the lines of the risings (udaya), culminations (madhya), and settings (asta) of these stars:

	Udaya	Madhya	Asta
Aśvini	47:28	4:10	21:52
Bharanī		6:25	
Kṛttikā		8:46	
Rohiṇī	54:38	10:55	27:24
Mṛgaśīrṣa		13:24	
Ārdra	58:36	14:11	29:48
Punarvasu	1:40	18:42	36:20
Puṣya		22:02	
Asleṣa		22:48	
Maghā	8:52	24:49	40:58
Pūrvā Phalgunī	10:34	27:32	44:28
Uttarā Phalgunī	12:38	29:0	
Hasta		30:42	
Citrā	18:48	32:58	47:08
Svāti	18:14	35:12	52:08
Viśakhā	23:52	36:32	50:08
Anurādhā	26:24	39:24	52:28
Jyesthā	27:58	40:34	53:14
Mula		43:18	
Pūrvāśādhā		45:12	
Uttarāśādhā		45:22	
Abhijit	27:12	46:10	5:08
Uttarāśādhā (sic)		46:40	
Śravaṇa	33:20	49:04	4:50
Dhanisthā		51:02	
Śatabhiśā		56:32	
Pūrvā Bhādrapada	39:38	57:06	14:36
Uttarā Bhādrapada	42:08	59:48	17:22
Prajāpati	53:12	14:12	34:10

Brahmahṛdaya	52:08	12:24	32:40
Lubdhaka	2:52	16:24	29:58
Matsyamukha	44:42	56:48	8:52
Kukkuṭapuccha	31:22	51:22	11:22

(1). 12ff. (a: 6 ff.; b: ff. 1–6). 20 × 30.5 cm. 14 lines. Designed to be hinged to the left. Each page in each half is for one zodiacal sign. Each has an argument from 0° to 29° horizontal.

a. To the left of each page are the names of the relevant nakṣatras and the times of their risings and culminations as the Sun is in each degree, to the right is a column of ascendants in degrees, minutes, and seconds.

b. To the left of each page are the names of the relevant nakṣatras and the times of their risings as the Sun is in each degree.

**SŪRYAPATTRAS** for the 12 zodiacal signs and pattras for 15 stars which are not nakṣatras. The Sūryapattras have as horizontal argument 0° to 29° of solar longitude in each zodiacal sign; the vertical argument consists of the nakṣatras that are visible during the time that the Sun is in that zodiacal sign. The time that each nakṣatra becomes visible, expressed in ghaṭikās, palas, and vipalas, on each night that the Sun has a given longitude is entered in the table. The tables for non-nakṣatra stars also have as horizontal argument 0° to 29°, but as vertical argument the appropriate zodiacal signs. Again, the times of the star's becoming visible on each night are recorded.

#### Manuscripts:

222. Puṇḍarīka jyotiṣa 20(a). 1 blank folium and f. 8. 13 × 26.5 cm.

Incomplete.

Ff. 8–8v. Sūryapattra for Scorpius. The nakṣatras are Śravaṇa through Āśleṣā. The times are for ghaṭikās and palas only.

223. Puṇḍarīka jyotiṣa 43(b). Ff. 1–12 and 12b–20. 10 × 21.5 cm.

Ff. 1–1v. Sūryapattra for Aries. Punarvasu through Uttarāṣādhā.

Ff. 2–2v. Sūryapattra for Taurus. Puṣya through Śravaṇa.

Ff. 3–3v. Sūryapattra for Gemini. Pūrvaphālgunī through Pūrvabhādrapadā.

Ff. 4–4v. Sūryapattra for Cancer. Citrā through Āśvinī.

Ff. 5–5v. Sūryapattra for Leo. Anurādhā through Rohiṇī.

Ff. 6–6v. Sūryapattra for Virgo. Mūla through Ārdrā.

Ff. 7–7v. Sūryapattra for Libra. Pūrvāṣādhā through Punarvasu.

Ff. 8–8v. Sūryapattra for Scorpius. Śravaṇa through Maghā.

Ff. 9–9v. Sūryapattra for Sagittarius. Śatabhiṣaj through Uttaraphālgunī.

Ff. 10–11v. Sūryapattra for Capricorn. Uttarabhādrapadā through Viśākhā.

Ff. 12–12v. Sūryapattra for Aquarius. Āśvinī through Jyēṣṭhā.

Ff. 12b–12bv. Sūryapattra for Pisces. Rohiṇī through Mūla.

- F. 13. Pattra for Brahmahṛdaya. Virgo through Pisces.  
 F. 13v. Pattra for Lubdhaka. Libra through Aries.  
 F. 14. Pattra for Lubdhakabandhu. Libra through Aries.  
 F. 14v. Pattra for Mahāpuruṣa. Scorpius through Taurus.  
 F. 15. Pattra for Siṃhahṛdaya. Sagittarius through Gemini.  
 F. 15v. Pattra for Pretaśiraḥ. Leo through Aquarius.  
 F. 16. Pattra for Mithunavāmahasta. Virgo through Pisces.  
 F. 16v. Pattra for Nadyantaka. Leo through Aquarius.  
 F. 17. Pattra for Viśākhāmātrmaṇḍala. Aquarius through Leo.  
 F. 17v. Pattra for Aśvamukha. Gemini through Sagittarius.  
 F. 18. Pattra for Kukudapuccha. Taurus through Scorpius.  
 F. 18v. Pattra for Agni. Virgo through Pisces.  
 F. 19. Pattra for Sarpadhāriśiraḥ. Pisces through Virgo.  
 F. 19v. Pattra for Marīci. Capricorn through Cancer.  
 F. 20. Pattra for Samudrapakṣin. Cancer through Capricorn.

F. 20v. A text in 4 lines describing the construction and use of these tables. It begins: svestasāyanaspastāsūryarāśipatrāt tadanṣeṣṭanakṣatrasampātajakoṣṭako grahyāḥ. It ends: khamadhyagatanakṣatraspastaghatya iṣṭāṁśās tad(d)aśamaghatibhir ūnāḥ śeṣaṁ tasminn a(m)śe rātrigataṁ bhavati.

A treatise on computing star charts. It begins: iṣṭanakṣatrasya nāḍivala-yākhyayamtre prācyāḥ paścimā vā nataghatikā grāhyāḥ || tās tatspastaghatīṣu ūnā vā yutāḥ kāryās.

Manuscript:

224. Puṇḍarīka jyotiṣa 45. Ff. 1–2. 10 × 21.5 cm. 9 lines. There are 4 prakāras: 1 untitled; 2 spastaghatyānaya(na); 3 ghaprādyas (ghatyādyas?) tad-(d)aśamānayaṇa; and 4 ghaprādi (ghatyādi?) prātar daśamaṁ bhavati.

F. 2v ends: tadrāśyaṁśasampātajakoṣṭakaḥ kalādyanupātena yuktaḥ spasto bhavati | sa eva dyaprādi (ghatyādi?) prātar daśamaṁ bhavati.

A description of the special relationships between stars, giving the color and magnitude of some. It begins: teṣāṁ ekanakṣatram kṛttikāsaṁjñam asti. The stars described are: Kṛttikā, Brahmahṛdaya, Hasta=Rohiṇī, Jabbāra, Khaḍga, Kaṭau, Mithunavāmahasta, Ārdra, Vāmapāda, Mṛgaśiras, Ākāśagaṅgā, Lubdhaka, Bandhulubdhaka, Punarvasu, Bālaśiras, Maghā, Pharahada (Yavana-bhāṣaya), Sarpa, Pūrvaphālgunī, Uttaraphālgunī, Siṃhapuccha, Citrā, Svāti, Hasta, Kanyāvāmahasta, Viśākhāmātrmaṇḍala, Vṛścikahṛdaya=Jyeṣṭhā, Abhi-jit, Śravaṇa, Sarpadharapurusaśiras, Kukkuṭapuccha, and Katikara.

Manuscript:

225. Puṇḍarīka jyotiṣa 26. Ff. 1–4. 10 × 21.5 cm. 9 lines. Formerly property of Dhaneśvara.



F. 4 ends in line 3 and at the beginning of the line 4: *evam mayā viṃśati nakṣatrāṇi kathitāni || ebhya unnatāṃśajñānaṃ bhavati.*

F. 4v. Blank.

Ownership note on f. 1: *pustakam idaṃ dhaneśvarasya śubhaṃ.*

### G. GEOGRAPHICAL TABLES

A list of some of the place names mentioned in the *Bhāgavata*, *Brahmāṇḍapurāṇa*, *Brahmapurāṇa*, *Brahmavaivartta*, *Garuḍapurāṇa*, *Harivaṃśa*, *Kūrmapurāṇa*, *Laghunārādīya*, *Līṅgapurāṇa*, *Mahābhārata*, *Mārkaṇḍeyapurāṇa*, *Matsya-purāṇa*, *Padmapurāṇa*, *Rāmāyaṇa*, *Śivapurāṇa*, *Skandapurāṇa*, *Vāmanapurāṇa*, *Vārāha*, *Vāyupurāṇa*, and *Viṣṇupurāṇa*.

Manuscript:

226. Khasmohor 2954. Ff. 1–5. 58 × 56 cm. Only rectos inscribed.

At the bottom of f. 5 is written: paṃcapatre(ṣu) navaśatapaṃcadaśa deśāḥ 915.

A table of localities with their noon equinoctial shadows, their equations of daylight (sometimes), and their oblique ascensions of the zodiacal signs. Composed before the foundation of Jayapura in 1727.

Manuscript:

227. Khasmohor 5082(a). F. 1. 11 × 25.5 cm.

The cities and their noon equinoctial shadows are:

āmbēra 6|0  
 paṭṭaṇā 5|45  
 cītroḍa 5|30  
 nāgora 5|54  
 ajamera 5|52, corrected by a later scribe to 6|9  
 lāhora 7|30  
 buṃdī 5|30  
 saṃbhāita 4|51  
 bijāpura 3|30  
 mathurā 6|28  
 jālora 5|11  
 kurukṣetra (6)|53  
 laṅkodayaḷagnam  
 gaṅgarā 6|10  
 dīlī 6|20  
 meḍato 5|56  
 rājanagare 5|6  
 laṃkā  
 jaimāraṇi 5|53

In the margin a later scribe has written: udayapure sāyamurānagare.

The remainder of the recto and the verso have an undistinguished text on astronomy and astrology.

A much fuller table entitled *Palabhājñāna*. Composed after 1727 since it includes Ja(ya)pura.

Manuscript:

228. Puṇḍarīka jyotiṣa 50. Ff. 1–4. 10 × 21.5 cm. 9 lines. Formerly property of Dhaneśvara Paṇḍarīka. A complete transcription follows:

[f.1v] śrīgaṇeśāya namaḥ || atha palabhā ||  
laṃkāpuryāṃ || akṣabhā 0|0|| akṣakarna 0|0|| carakhaṃḍakah || 00||00||00||  
paramadina ||30||00||

kāmtinagaryāṃ || akṣabhā ||3||23|| akṣāṃśa ||15||43|| akṣakarna 12||28|| ca-  
rakhaṃḍaka ||34||27||11|| paramadina ||32||22||

anāgūdī || bijānagara || akṣabhā ||4|| akṣāṃśa ||18||33||24|| akṣakarna ||12||14||  
carakhaṃḍaka ||40||32||13|| paramadina ||32||50||

anāttadamveradara || akṣabhā ||4||15|| akṣāṃśa ||19||38||41|| akṣakarna ||12||  
||28|| carakhaṃḍaka ||42||34||14|| paramadina ||33||0|| laṃkāyojana ||146||

bhṛgukacha bhavokṣa || akṣabhā ||4||51|| akṣāṃśa || 22||10||30|| akṣakarna  
||12||56|| carakhaṃḍaka ||48||39||16|| paramadina ||33||26|| laṃkāyojana ||192||

devagiri || akṣabhā ||4||25|| akṣāṃśa ||20||19||36|| karna ||12||43|| carakhaṃḍa-  
ka ||44||38||15|| paramadina ||33||8|| laṃkāyojana ||167||

tilaṅgā || akṣabhā ||3||55|| [f.2] akṣāṃśa || 18||24|| paramadina ||32||46||  
karna ||12||37|| carakhaṃḍaka ||39||31|| 13|| laṃkāyojana ||146||

avaṃtī || akṣabhā ||5||9|| akṣāṃśa ||23||15||9|| karna ||13||5|| carakhaṃḍaka  
||41||41||57|| paramadina ||33||38|| laṃkāyojana ||206||

ajamera || akṣabhā ||6|| akṣāṃśa ||26||32||9|| karna ||13||25|| carakhaṃḍaka  
||60||48||20|| paramadina ||34||16|| laṃkāyojana ||247||

āsīpattanī (<|| a>)kṣabhā ||5||35|| akṣāṃśa ||24||14|| akṣakarna ||13||25|| cara-  
khaṃḍaka ||56||44||18|| paramadina ||33||56|| laṃkāyojana ||227||

citrakūta || akṣabhā ||5||30|| akṣāṃśa ||24||34||33|| akṣakarna ||13||13|| cara-  
khaṃḍaka ||55||44||18|| paramadina ||33||54|| laṃkāyojana ||223||

gargarād (<||>) akṣabhā ||5||0||20|| akṣāṃśa ||24||00|| karna ||23||27|| carakha-  
ṃḍaka ||53||43||18|| paramadina ||33||48|| laṃkāyojana ||215||

nāgora (<||>) 'kṣabhā ||5||58|| akṣāṃśa ||26||00|| karna ||13||42|| carakhaṃḍaka  
||59||47||19|| paramadina ||34||12|| laṃkāyojana ||246||

[f. 2v] sit(ā)pura [||] uttare (<||>) akṣabhā ||4||40|| akṣāṃśa ||21||13||0||  
karna ||12||52|| carakhaṃḍaka ||47||27||15|| paramadina ||33||54|| laṃkāyojana  
||180||

somanāthapattana || akṣabhā ||5||6|| akṣāṃśa ||23||9||37|| akṣakarna ||13||42||  
carakhaṃḍakah ||51||41||17|| paramadina ||33||38|| laṃkāyojana ||204||

medherū anahalavāḍu [||] pātana gujarāta || akṣabhā ||5||20|| akṣāṃśāḥ ||24||0||  
akṣakarna ||13||10|| carakhaṃḍaka ||53||43||18|| paramadina ||33||48|| laṃkāyojana  
||218||

tihunagiri || akṣabhā ||6||0|| akṣāṃśāḥ ||26||32|| akṣakarna ||13||42|| carakha-  
ṃḍaka ||51||41||17|| paramadina ||34||38||16|| laṃkāyojana ||247||

abhoraū || akṣabhā ||(7)||13|| akṣāṃśāḥ ||31||0||0|| akṣakarna ||14||0|| cara-  
khaṃḍaka ||72||58||24|| paramadina ||35||8|| laṃkāyojana ||318||



yoginīpura dillī || akṣabhā ||6||34|| akṣāṃśāḥ ||28||34|| akṣakarna ||13||40||  
 carakhaṇḍaka ||65||53||22|| paramadina ||34||4|| laṃkāyोजना ||272||  
 hāsī dhīlīsamīpe || akṣabhā ||6||35|| akṣāṃśāḥ ||28||56|| [f. 3] akṣakarna  
 ||13||44|| carakhaṇḍaka ||66||53||22|| paramadina ||34||42|| laṃkāyोजना ||278||  
 gopāvala || a||kāliṇjara || akṣabhā ||5||45|| carakhaṇḍaka ||57||46||29||  
 lākherī ||5||30|| cara ||55||44||18||  
 vurahānahana || akṣabhā ||4||30|| carakhaṇḍaka ||54||36||15||  
 sīhānade ||akṣabhā ||7||  
 dili ||6||20||  
 āgaro ||6||10||  
 vīdhānagara ||2||51||  
 bikānera ||7||0||  
 varodā ||4||52||  
 valada ||8||10||  
 virāt ||6||27||  
 bharoṃca ||4||55||  
 bhṛgukacha ||4||58||  
 māṇḍom ||4||47||  
 mathurā ||6||2||  
 murora ||5||46||  
 mulatāna ||6||4||  
 mithilā ||6||0||  
 jodhapura ||5||58||  
 japura ||6||6||  
 bharatapura ||6||  
 romeśvara ||1||30||  
 rājamahala ||5||35||  
 rohitaka ||6||37||  
 rājagaḍha ||5||30||  
 raṇathanibhora ||5||34||  
 somanātha ||3||6||  
 saṃbhala ||6||21||  
 lāhora ||7||30||  
 lavaṃgapura ||5||35||  
 lasavatī ||5||0||  
 lakhaṇaū ||5||45||  
 sīhora ||5||00||  
 sāgarapura ||5||52||  
 stabhatīrtha ||4||51||  
 geḍhadeśa ||5||10||  
 gayā ||5||50||  
 gokula ||6||00||  
 gagharāt ||5||25||  
 cola ||4||00||  
 cadelī ||5||5||  
 jālora ||5||13||

jalālāvāda ||8|00||  
 [f. 3v] chagopa ||3||00||  
 ṭhadom ||5||36||  
 ugūrapura ||5|(3)<||  
 ṭākā ||6|20||  
 tājapura ||5(|)42||  
 tailaṃga ||4[5]|40|  
 thānapura ||6|30||  
 dirasa |6||20|  
 dvārikā ||5|5|  
 radaurakā ||4||25||  
 dolatāvāda ||4|15|  
 dvārāvatī ||6||5|  
 devagiri ||4||25|  
 tilaṃga ||3|55||  
 vuṭānapura ||4||30||  
 avaṃtikā |5(|)9||  
 ajamera ||6(|)00||  
 śrīpattana ||5|35||  
 vigudha |5|30|  
 gargarāt ||5<||)20|  
 gadhā ||4||32||  
 gahora ||5||47|  
 ayodhyā ||5|52|  
 ajamera ||5||6||  
 ruhamadāvāda |6<||)00||  
 avaṃtī ||5||25||  
 amarakoṭa ||4||36|  
 ahamadānagara ||6|12|  
 ābhānora ||6|45|  
 āpasetatā <||)6||20|  
 imya |5(|)2|  
 utkala |5[(1)5]|45|  
 udayapura ||5(|)35|  
 oṭa ||4(|)6|  
 oṭhachā ||5||45[||2||  
 kāśmīra ||7|52|  
 kābila ||8||25||  
 kālipī ||5|45|  
 kāṃtī ||3||13||  
 kovana ||3||15||  
 kanoja ||6(|)20|  
 kurukṣetra ||6|36<||  
 kampilā ||6|16|  
 kedāra ||7(|)1||  
 khaṃbhāyana ||6||45||

gaṃgāsāgara ||6||57||  
 golakuṇḍā ||3|45||  
 gvāliyara ||5||52||  
 vabūnagara ||6||00||  
 nāgora ||5|58||  
 śīdapura ||4||40||  
 gujarāta ||5||20||  
 pāṭaṇa ||3|36||  
 hari[f. 4]dvāra ||6||36||  
 hastināpura ||6|21||  
 hedarāvāda ||4||00||  
 samasāvāda ||6(|)21||  
 sūrata ||4||47||  
 dohara ||5(|)5||  
 deśāha ||5||4||  
 śadhigāma ||4||40||  
 dābhola ||5||0||  
 damanapura ||5||45||  
 dholapura ||5||2||  
 dhāmonī ||5||0(|)||  
 niramadā ||5(|)5||  
 nāgora ||5||51||  
 nagarakoṭa ||7||40||  
 nāsaketa ||5|4||  
 narmadā ||4||47||  
 nadanagara ||5(|)5(|)||  
 kopāla ||6(|)20||  
 naimiṣa ||5||45||  
 prayāga ||5||45||  
 vāṇarasi ||5||45||  
 pāṭaṇā ||5||45||  
 peśora ||8(|)00(|)||  
 papari ||4||30||  
 prakāśa ||4||51||  
 pāṇḍava ||4(|)1||  
 puruṣottama purī ||5||56||  
 panātaveda ||4|51||  
 vedara ||3|45(|)||  
 bahlīgapura ||4||30||  
 būdī ||5||30||  
 bījāpura ||3||6||  
 śrīnagara ||6||40||  
 jodhapura || akṣabhā ||5||58|| akṣāṃśa ||26||54 | karṇa ||13|24| carakhaṇḍaka  
 ||59||47||20|| paramadina ||34||12| laṃkāyोजना ||245 (||)  
 thāneśvara kurukṣetra (||) akṣabhā ||6||50|| akṣāṃśa ||30||10| karṇa ||13|51||  
 [a]carakhaṇḍaka ||62||55|23||



kumāü ||akṣabhā ||6||44||

F. 4v. Blank.

Ownership-note on f. 1: palabhādipustaka paunḍarīka || dhaneśvarasya.

## II. ASTRONOMICAL INSTRUMENTS

The **YANTRARĀJĀGAMA** composed by Mahendra Sūri for Fīrūz Shāh, the Tughluq Sulṭān from 1351 to 1388, in about 1370. See *CESS* A4, 393b–395a, and A5, 296b–297a. Edited with the *tikā* of Malayendu by K.K. Raikva, Mumbai 1936. The first verse is:

śrīsarvajñapadāmbujam hr̥di parāmr̥śya prathāvapradam  
śrīmantam madanākhyasūrisugurum kalyāṇakalpadrūmam |  
lokānam hitakāmyayā prakur̥nte sadyantrarājāgamam  
nanabhedayutam camatkṛtikaram surir mahendrābhīdhaḥ ||

### Manuscripts:

229 Khasmohor 4958. ff. 1–46. 11.5 × 27.5 cm. 9/10 lines. Ff. 1 and 46 torn. Paper old and torn. With the *tikā* of Malayendu. With some marginalia. Copied by Kṛṣṇa on Friday 5 March 1596.

Colophon on ff. 45v–46: samāptā yantrarājādhyāyasya *tikā* kṛtir iyaṁ śrī-madbhṛhadgachamandana[ff. 46]śrīmahendrasūrisiṣyaśrīmalayacandrasūriṇā vi-racita.

After this are written 30 verses on various astronomical problems. The first is:

nāgambhodhiyamāḥ surāḥ sitabudhan pūrvoditau 248|33 tiṣṭhataḥ  
prācyam astamitau matamgajanagā 78 vṛndārakā 33 vāsarāḥ ||  
varuṇyam uditau divakaravaśāt tau śīghrabhukṭi sadā  
tavamṭṭye vadinānyadr̥śyavapuḥsauḥsau tulyāni digbhūmitaiḥ || 1 ||

### The last is:

nadyaś care paṁcadaśo janānyaś  
caikam dīnam śastighaṭipramāṇam ||  
nīśapi tavatpramitais ca bhūyāt  
saumyam tv ajāder vanijaś ca yāmyam || 30 ||

After this is the post-colophon:

vajibhūtiḥ 1517 mite śakakāle  
śuklaphalgunaharau bhṛguvāre ||  
ravipusye ||  
kṛsnasamjñaganakāḥ svaparārtham  
yamtrarajam alikhaḍ vividhārtham || 1 ||  
kim vanena dhanena vājkaribhiḥ prājyena rājyena kim  
kim vā putrakalatramitrapaśubhir dehe(na) gehena kim ||  
hitvantat kṣaṇabham gur(u)m sa padire sarvaṁ mano dūrataḥ  
svatmartham guruvakyato bhaja bhaja śrīpārvatīvallabham || 1 ||

230. Khasmohor 4974. Ff. 1–15. 11.5 × 26 cm. 10 lines. Paper darkened in places. With occasional pūrvamātras. With the ṭikā of Malayendu. Copied by Śrīdatta, the son of Śaṅkaradāsa Vyāsa of the Śrīmālājñāti, a resident of Jodhapura, on Saturday, 11 January 1617 during the reign of Mahārājādhirāja Sūryasiṃha, who ruled Marwar from 1595 to 1620.

Colophon on f. 15v: iti śrīyantrarājāgame spaṣṭādhyāyaḥ pañcamah.

Post-colophon: saṃvat 1673 varṣe śāke 1538 pravarttamāne pauṣamāse śuklapakṣe pūrṇimāsyāṃ tithau śānivāre likhito yaṃ yantrarājaḥ || jodhapuranagare vāstavyaṃ mahārājādhirājamahārāśrīsūryasiharājye śrīmālājñātī vyāsaśaṅkara-dāsātmajena śrīdattena likhitam ātmapaṭhanārtham iti.

After this is written: pratyasuddhatvād asuddham kiṃcid asti madīyo na doṣaḥ. yādṛśaṃ drṣṭaṃ tādrśaṃ likhitam.

Price on f. 1: kī° ≡.

231. Khasmohor 4973. Ff. 1–2, {3}, and 4–42. 11 × 24.5 cm. 15–17 lines. With marginalia and an occasional pūrvamātra. With the vyākhyā of Malayendu Sūri. Copied by Śrīdatta, a resident of Śubhaṭapura, the son of Śaṅkara Vyāsa, the son of Puruṣottama Vyāsa of the Śrīmālājñāti, at Śuddha-dantī on Sunday 2 November 1617.

Colophon on f. 42: samāptā yaṃtrarājādhyāyasya ṭikā || kṛti śrīmadbṛhad-gache śrīmalayacaṇḍrasūriṇā.

Post-colophon: saṃvat 1674 varṣe śāke 1539 pravarttamāne śuklapakṣe pūrṇi kārttikamāse pūrṇimāyāṃ tithau raviravivāsare vyā° śrīmālājñātīvyāsapuruṣo-ttamasutavyāsaśaṅkara tatputraśrīdattaliṣitam ātmapaṭhanārtham || śubhaṭ-puraṭamadhye vāstavyaṃ || śuddhadantīmādhye likhitam.

Price on f. 1: kī° ḷ.

232. Khasmohor 5469. Ff. 1–59. 13 × 31 cm. 11 lines. F. 20v blank with no break in text. With the vyākhyā of Malayendu Sūri. Copied from manuscript 229 by Tulārāma at the command of Mahārājādhirāja Jayasiṃha on Monday 23 September 1706.

Colophon on f. 58v: samāptā yaṃtrarājādhyāyasya ṭikā kṛtir iyaṃ śrīmad-bṛhadgacchamaṇḍanam (śrīmahemaṇḍrasūriśiṣyaśrīmalayacaṇḍrasūriṇā viracitā).

Post-colophon on ff. 58v–59: saṃvat 1763 varṣe āśvinakṛṣṇa 13 some [f. 59] śrīmanmahārājādhirājaśrījayasiṃhadevajīkasyājñayā likhitam idaṃ tulārāmeṇa.

On f. 59 are written the 30 verses found on f. 46 of manuscript 229 followed by the beginning of that manuscript's post-colophon:

vājibhūtithi1517mitai śakakāle  
śuklaphālgunaharau ravipuṣpe.

Price on f. 1: kī ṣ||| ≡.



233. Khasmohor 4975. Ff. 1-16. 12 × 26.5 cm. 8/9 lines. With some marginalia. With Malayendu Sūri's final verse at the end. Copied by Tulārāma at the command of Mahārājādhirāja Jayasīṃha on Saturday 16 November 1706.

Colophon on f. 16: iti śrīyaṃtrarājā samāptaḥ.

Post-colophon: śrīmanmahārājādhirājajīśrījayasīṃhadevājīkasyājñayā saṃ 1763 varṣe mārgaśīrṣakṛṣṇa 8 śanau likhitam idaṃ tulārāmeṇa.

Price on ff. 1 and 16v: kī || = j.

234. Puṇḍarīka jyotiṣa 9. Ff. {1}, 2-25-1, 25, 25-2, and 26-45; and f. {A}. 12.5 × 27.5 cm. 12/13 lines. F. 25-1v blank. With the vyākhyā of Malayendu Sūri. With marginalia. Copied from manuscript 229 by Gopīnātha, the son of Rāmeśvara Vyāsa, for Jāgeśvarajīka on Sunday 14 December 1788.

F. {1v}. Table of the Sines for 1° to 90° with R=60. The entries have sexagesimal fractions with 4 to 6 places.

Ff. 2-2v. Table of the Sines with differences for 1° to 90° with R=3600. This is the table found on pp. 2-4.

Ff. 2v-3. Table of the Versines with differences for 1° to 90° with R=3600. This is the table on pp. 4-6.

F. 3 begins in 1,5a (p. 2, 11): yat syāl lavādhaḥ kalikādikaṃ ta(d).

F. 24v ends in the vyākhyā on 1,67 (p. 46, 27-28): anyac ca kā.

F. 25-1 is a śodhapatra written by a second scribe, who also copied f. 25-2 and f. {A}. It begins in the vyākhyā on 1,67 (p. 46, 28): lacakraparidhicakrāṃśānām.

F. 25-1 ends in the vyākhyā on 1,68-69 (p. 49, 16-17): chāyākaṇau (prasādhyau).

F. 25-1v. Blank.

F. 25 begins: athaiṣaṃ pratyamśaṃ koṣṭakeṣu nyāso yathā. There follows the table on pp. 47-49.

F. 25v ends with the table on pp. 49-51.

Ff. 25-2-25-2v is another śodhapatra copied by the second scribe. Its contents are virtually identical with those of ff. 25-25v.

F. 26 begins with 1,71a (p. 51,21): abhūd.

Colophon on ff. 45-45v: samāptā yaṃtrarājādhyāyasya ṭikā kṛtir iyaṃ śrīmadbṛhadgachamaṇḍanaśrīmahemḍrasūriśiṣyaśrīmala[f. 45v]yacaṇḍrasūriṇā vi-racitā.

After this is written: śrīrāmaḥ śaraṇaṃ mameti paramo maṃtro yaṃ aṣṭā-kṣaraḥ.

There follow the 30 verses, the post-colophon, and the final verse found on f. 46 of manuscript 229. Then: śrīviśveśvaraḥ prīṇātv anena śrameṇa.

Post-colophon on f. 45v: likhitam idaṃ pustakaṃ vyāsopanāmakarāmeśvarasyātma-jagopīnāthena śrījāgeśvarajīkasya paṭhanārthaṃ ca || saṃvat 1845 śāke 1710 pravarttamāne pauṣavadi 1 ravivāre.

On f. {A} the second scribe has written: atha valayayaṃtraṃ ||

vṛttārdham dhṛti18bhāgaṃ ekaikasyāpi pañcabhir guṇitaṃ |  
tasyāṃśake caturthe chidre sūcyagrabhāgena || 1 ||

bhāgā nirekā guṇasaṃguṇās te  
dinārdhabhaktā dinaśeṣanādyah ||

iti valayayaṃtram ||

atha cāvukayaṃtram ||

śaṃku(h) prakalp(y)o (r)kamtāṅgulo (t)ra  
tanmānato vuddhimatā ca vṛddhiḥ ||  
yaṣṭi(h) prakalp(y)ākṛtisaṃguṇā vā  
syāt kalpanā sadgurusampradāyāt || 1 ||

This is Hema, *Kaśāyantra* 2.

śaṃkuprabhāgraṃ sprśatiha ya[m]tra[m]  
taccihnataḥ (sre<sup>a</sup>) khalu tadpramāṇe |  
jñeyam<sup>b</sup> dyumāne (tra) tu<sup>c</sup> yanmitāṅkas  
tattulyasaṃkhyā ghaṭikā krameṇa || 2 ||

This is a variant of Hema, *Kaśāyantra* 14.

iti cāvukayaṃtram ||

a. sve. b. neyam. c. ca.

varttamānaśākena saha etasyāṃ 1527 taram kṛtvā  
caturddhā sthāpyaṃ paścād anena 1|15|30|31 guṇyaṃ  
kṣepayutaṃ tahaviḥ.

1	4	7	2	7	3	6	1	3	4	6	7
34	13	29	42	8	20	6	20	7	34	9	41
30	53	38	16	48	32	24	50	40	33	40	30

Then a third scribe has written 4 verses identical to those found on f. (1-1v) of manuscript 199.

F. (Av). Blank.

235. Khasmohor 5206(b). F. 5. 23.5 × 10 cm.

F. 5-5v. Table of the shadow cast by a 7-digit gnomon as the altitude of the Sun increases from 1° to 90°. This is the bottom half of the table on pp. 49-51.

Colophon on f. 5v: samāpto yaṃ grathah.

The **YANTRARĀJĀGAMAVYĀKHYĀ** composed by Malayendu Sūri

in about 1382. See *CESS* A4, 363a–364b, and A5, 282b–283a. Edited by K. K. Raikva, Mumbai 1936. The first verse is:

praṇamiya sarvajñapadāravindaṃ  
sūrer mahendrasya padāmbujaṃ ca |  
tanoti tadgumphitayantrarāja-  
granthasya ṭikāṃ malayendusūriḥ ||

See manuscripts 229–232 and 234, and *cf.* manuscript 233.

The **DHRUVABHRAMAYANTRA** composed by Padmanābha as part of his *Yantraratanāvalī* in about 1400. See *CESS* A4, 170b–171b, and A5, 205b. The first verse is:

śrīnarmadānugrahalabdhajanmanaḥ  
pādāravindaṃ janakasya sadguroḥ |  
natvā triyāmāsamayādibodhakaṃ  
dhruvabhramaṃ yantravaraṃ bravīmy atha ||

#### Manuscripts:

236. Puṇḍarīka jyotiṣa 11. Ff. 1–6. 12.5 × 27 cm. Tripāṭha. With the ṭikā by Padmanābha. Copied by Gopinātha, the son of Rāmeśvara Vyāsa, on Thursday 5 November 1789. Formerly property of Viśveśvara, the son of Rāmeśvara.

The ṭikā begins on f. 1v: atha dhruvabhramākhyayaṃtrādhikāraḥ prārabhyate ||

Colophon of mūla on f. 6v: iti dhruvabhramākhyayaṃtraṃ samāptam.

Post-colophon: saṃvat 1846 śāke 17011 mārgaśīrṣakṛṣṇe 3 guruvāsare likhitam idaṃ pustakaṃ vyāsopanāmakarāmeśvarasyātmajagopināthena.

The ṭikā ends on f. 6v: athāparoditaḥ dhruvakenāpi na proktaṃ tad etat kautukāt kṛtaṃ.

F. 6v. Blank.

Ownership note on f. 1:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
dhruvabhramākhyayaṃtrasya satīkasya hi pustakaṃ |

237. Khasmohor 5206(a). Ff. 1–5. 10 × 23.5 cm. 9 lines.

On ff. 1v–2 is a text on determining the length of nighttime in 10 verses. The first of these is: dhruvamatsyopari<sup>a</sup> rātryānayanam

nijodayair meṣabhato<sup>b</sup> vilagnaṃ ||  
bhūbhūta<sup>5</sup>lnādījanitaṃ<sup>c</sup> (tu) yasmāt ||



ūrddhvasthapu(c)che<sup>d</sup> sati tad vilagnaṃ  
rūpākṣi(21)nāḍījam<sup>e</sup> adha(h)sthapu(c)che || 1 ||

a. °matsyaupari. b. mekhabhato. c. °nāḍījanitaṃ. d. urdvastha°.  
e. rūpākṣi°.

The last verse is:

tadvyāśasakte mukhato (+ +) re  
yathā tathā dhāryam idaṃ karābhyāṃ  
pu(c)chaṃ tu vai vorddh(va)talāṇikato (')ṃśā  
natonnatā keṃdragalaṃbam uktā || 10 ||

F. 2v begins, after śrīgaṇeśāya namaḥ, in 1a: śrīnarmadānugrahalabdhaṃ.  
Colophon on f. 5v: iti śrīpadmanābhaviracitaṃ dhruvabhramayaṇtraṃ sam-  
āptaṃ.

The **DHRUVABHRAMAYANTRAṬĪKĀ** composed by Padmanābha in about 1400. See *CESS* A4, 171b–172a, and A5, 205b. It begins: atha dhruvabhramākhyayaṃtrādhikāraḥ prārabhyate || tatrāpi nirvighnaparisamāp-  
tyartham abhiṣṭadevatānamaskārarūpaṃ maṅgalaṃ ācaratīndravamaṣena.

See manuscript 236.

The **YANTRACINTĀMAṆI**, composed by Caktadhara, presumably in the sixteenth century. See *CESS* A3, 36b–37b; A4, 88a; and A5, 103b–104a. The first verse is:

natvā phalāptyai pramathādhināthaṃ  
raviṃ guror aṅghryaravindayugmam |  
yantraṃ pravakṣye gaṇitānapekṣam  
āsuprabodhaṃ samayādikānām ||

Manuscript:

238. Khasmohor 4954. Ff. 1–4. 12 x 26.5 cm. 8 lines. With some marginalia. Copied by Tulārāma at the command of Mahārājādhirāja Jayasiṃha on Thursday 14 November 1706.

Colophon on f. 4v: iti śrīvāsudevasutatamaṃtrajñasiṃhaśrīcakradharaviracitā (corrected to: svaviracitā yaṃtra, but crossed out) (yaṃtra)cintāmaṇivivṛti (vivṛti crossed out) samāptā.

Post-colophon: saṃ 1763 mārgaśīrṣakṛṣṇe 6 gurau śrīmanmahārājādhirāja-  
śrījayasiṃha devajīkasyājñayā likhitam idaṃ tulārāmeṇa.

Price on f. 1: kī –|||.

The **PRATODAYANTRA** composed by Munīśvara and incorporated by him in the uttarārdha of the *Siddhāntasarvabhauma* that he composed at Kāśī

in 1646. For the siddhānta see *CESS* A4, 438b–439b, and A5, 314a. The *Pratodayantra* was edited with Muniśvara's own *ṭikā* by S. D. Sharma, Kurali [1982]; see Y. Ohashi in *IJHS* 33, 1998, supplement pp. 188–192. The first verse is:

gaṇeśoditam yantram etat pratodam  
anāyāsakālāvabodham pravacmi |  
nījerchāvasād iṣṭadairghyaḥ sudaṇḍo  
'natisthūlakah śiṃśivr̥kṣādijātaḥ ||

Manuscript:

239. Puṇḍarīka jyotiṣa 44(a). Ff. 1–5. 10 × 21 cm. 7/8 lines. With Muniśvara's own *ṭikā*. With some marginal notes.

Colophon on f. 5v: iti pratodayaṃtram samāptam.

The **PRATODAYANTRAṬĪKĀ** composed by Muniśvara and incorporated into his *Āśayaparakāśini*, a commentary on the *Siddhāntasārvabhauma* which he completed at Kāśī in 1650. For the *Āśayaparakāśini* see *CESS* A4, 439b–440a, and A5, 314a–314b. The *Pratodayantraṭikā* was edited by S. D. Sharma, Kurali, [1982]. It begins: etat prasiddham pratodayaṃtram gaṇeśa-daivajñair asmadgurutamaiḥ kalpitam aham nirūpayāmi.

See manuscript 239.

The **YANTRARĀJARACANĀ** composed by or for Mahārājādhirāja Jayasimha in about 1720. See *CESS* A3, 63b–64a; A4, 97b; and A5, 117b. Edited by Kedāranātha Jyotirvid in *RPG* 5, Jayapura 1953, pp. 1–17. It begins: ādāv abhiṣṭam yantram dhātujaṃ dārujaṃ vā vartulaṃ kāryam.

Manuscript:

240. Puṇḍarīka jyotiṣa 10. Ff. (A) and 1–13. 12.5 × 28 cm. 9 lines. With some marginalia. Formerly property of Viśveśvara, the son of Rameśvara.

Colophon on f. 13v: iti śrīmanmahārājādhirājarājarājeśvaraśrībhūpālabhūpaśrījayasimhakāritā racanopapattivedhaprakriyā samāptā.

Ownership note by a second scribe on f. (A):

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
yaṃtrarājavidheḥ pustam jagaj jānātv idam śubham || 1 ||

After this a third scribe has written:

kāle vāridharāṇām apatitayā naiva śakyate sthātum |  
utkaṃthitāsi tarale na hi na hi sakhi picchilāḥ paṃthāḥ || 1 ||

vyādhūya yad rasanam ambujalocanāyā  
 vakṣojayoḥ kanakakuṁbhavikāśabhājoh |  
 āliṅgasi prasabham aṅgam aśeṣam asyā  
 dhanyas tv ameṣa sacalācalagaṇḍhavāha || 1 ||

utkṣiptaṁ saha kauśikasya pulakaiḥ sārddhaṁ mukhair nāsitaṁ  
 bhūpānāṁ janakasya saṁśayapriyā sā kaṇṣam āspālitaṁ |  
 vaidīṁ hīmanasā samaṁ ca sahasā kṛṣṭaṁ tato bhārgava  
 praudhāhaṁ kṛtikaṁ dalena ca samaṁ tadbhagnam aiśaṁ dhanuḥ || 1 ||

Ff. (Av)–1. Blank.

The **YANTRASĀRA** composed by Nandarāma Miśra in 1771. See *CESS* A3, 130b, and A5, 157a–157b. The first verse is:

śrīmadgokulanāthaṁ natvā vaksye laghukriyayā |  
 kiṁcid yantrasamudrāt sāraṁ bālāvabodhāya ||

Manuscripts:

241. Puṇḍarīka jyotiṣa 14. Ff. 1–36, 36b, and 37–39. 11.5 × 25.5 cm. 9 lines. With some marginal notes. Copied on Sunday 1 January 1792.

F. 36 was left blank by the original scribe; a second scribe has written on it a table of the Sines (with  $R=60$ ) and the reversed shadows (tangents) in digits for  $1^\circ$  to  $90^\circ$ , though entitled *pratyaṁśaṁ jyākṛāṁtyaṁśā vilomachāyā cāṅgulādyā*. This table is imperfect; *aśuddheyaṁ sārāṇī* is written above it.

Ff. 36b–36bv were added by this second scribe to supply a correct table of Sines (with  $R=60$ ), declinations (with  $\epsilon=23;35,0^\circ$ ), and tangents measured in digits (with  $g=12$ ) for  $1^\circ$  to  $90^\circ$ .

Colophon on f. 39: *iti śrīmiśranandarāmavirācite yaṁtrasāre upasaṁhārā-dhyāyaḥ samāpto yaṁ graṁthaḥ*.

Post-colophon: *saṁvat 1849 || varṣe pauṣaśukla 8 ravivāre*.

F. 39v. Blank.

On f. 1 the second scribe has written an *anukramaṇikā* (on the left is noted the folium number, on the right the *adhyāya* number):

	palayaṁtraṁ 1	
2	dhanuryaṁtraṁ 2	
	phalakayaṁtraṁ 3	
3	kapālayaṁtraṁ 4	
	valayayaṁtraṁ 5	
4	turiyayaṁtraṁ 6	
9	sarvadeśīyaṁtraṁ 7	



- 10 svadeśīyaṃtram 8  
 11 anyaturīyayaṃtram 9  
 16 laghuprakārasarvadeśīyaṃ 10  
     svadeśīyaṃ 11  
     yaṃtram vinaiva dinādyānayanam 12  
     yaṃtrarājaparakārah 13  
 21 krāntivalayaṃ 14  
     golaracanāprakārah 15  
 33 upaskāraracanāpra 16  
     golarahasyanāma 17  
 35 śaṃkuyaṃtram 18  
     daṃḍayaṃtrāṇi 19  
 37 pratyamśajīvāvilomachāyājñānārtham cakram 20  
     carārddhodayādisaṃgrahaḥ 21

242. Puṇḍarīka jyotiṣa 13. Ff. 1–14 and (15). 10.5 × 22 cm. 9 lines. Incomplete.

F. (15) ends, in line 1, in 9, 12a: carajyayā.

The **PALABHĀYANTRA** composed by Viśveśvara Mahāśabda Puṇḍarīkayājin in about 1790/1800. (See *CESS* A5, 700b–701b.) The first verse is:

gaṇeśam jānakījāniṃ natvā viśveśvaraḥ sudhīḥ |  
 palabhāyantranirmāṇam sugamam kurute sphuṭam ||

Manuscript:

243. Puṇḍarīka jyotiṣa 32. 2 ff. 10 × 21.5 cm. 11/12 lines.

F. (2v) ends: tasminn eva vṛtte datvā sarveṣv apy asreṣu ghaṭyaḥ sādhanīyāḥ.

The **NALIKĀBANDHAKRAMAPADDHATI** composed by Rāmakṛṣṇa. See *CESS* A5, 453a. The first verse is:

śrīkeśavam namaskṛtya rahasyapadyasaṅgrahāt |  
 karomi nalikābandham rāmakṛṣṇo yathākramam ||

Manuscript:

244. Khasmohor 5295. Ff. 1–8. 12 × 25.5 cm. 8 lines. Copied by Tulārāma on Tuesday 17 September 1706.

Colophon on f. 8v: iti jyotirvidrāmakṛṣṇaviracitā nalikābaṇḍhakramapad-dhatih | samāptā.

Post-colophon: saṃ 1763 āśvinakṛṣṇa 7 bhaume likhitam idaṃ tulārāmeṇa.

Price on f. 1: kī = ||.

A text on the gnomon in 10 verses. The first is Gaṇeśa, *Grahalāghava* tripraśnādhikāra 21:

vṛtte samabhūgate tu kendrasthita-  
śaṅkoḥ kramaśo viśaty apaiti |  
chāyāgram ihāparā ca pūrvā  
tābhyāṃ siddhatimer udak ca yāmyā ||

Manuscript:

245. Puṇḍarīka jyotiṣa 18. 1 blank folium and ff. 1 and (2). 10 × 21.5 cm. 9 lines. With marginal notes.

F. 1v ends in 9d: paṃkter dalaṃ syāt padaṃ | 9 |

On f. (2) verse 10 is found on f. 5v of manuscript 79:

mūlāvaśeṣakaṃ saikaṃ ṣaṣṭighnaṃ vikalānviṭaṃ  
dviṣaṃguṇadvīyuktena mūlenāptaṃ sphuṭībhavet || 10 ||

After this is written:

meṣādāv uttaro golaḥ tulāḍau dakṣiṇa(h) smṛtaḥ ||

A second scribe has added lines found on f. (A) of manuscript 79:

chāyeṣughnākṣabhāyāḥ kṛtidaśamaḥavanā yamāśāḥ palāṃśāḥ ||  
atha vedābdhyabdhīyūnaḥ kharasahr̥taḥ śako yanāṃśāḥ ||

F. (2v). Blank.

A treatise on determining the ghaṭī at Jayapura from the length of a gnomon's shadow. It begins: savāijayanagare sveṣṭachāyāto ghaṭījñānam.

Manuscript:

246. Puṇḍarīka jyotiṣa 51. Ff. 1–2. 10 × 21.5 cm. 9 lines on f. 1v.

F. 2 ends, at the beginning of line 5: sveṣṭachāyāto ghaṭījñānasya patram.

F. 2v. Blank.

## I. MISCELLANEOUS

The **SIDDHĀNTASAMHITĀSĀRASAMUCCAYA** composed by Sūrya at Pārthapura in about 1543. See *CESS* A6. The first verse is not available.

Manuscript:

247. Khasmohor 5026. 1 blank folium and ff. 1-8 and 10-49 (text continuous). 12 × 33.5 cm. 5-10 lines. Ff. 14-23 also numbered 1-10; ff. 24-31 also numbered 1-8; ff. 32-40 also numbered 1-9; and ff. 41-49 also numbered 1-9. With marginalia. Incomplete (sauramāna 14-51 on ff. 1-3v; cāndramāna 1-22 on ff. 3v-4v; sāvanamāna 5-38 on ff. 4v-6; pitṛmāna 1-15 on ff. 6-7; śīśirartu 1-26 on ff. 7-8v; vasanta 1-17 on ff. 8v and 10; grīṣma 1-15 on ff. 10-11; varṣāḥ 1-9 on ff. 11-11v; śarad 1-13 on ff. 11v-12v; hema 1-9 on ff. 12v-13; bhuvana 1-63 on ff. 13-17; mahābhūjādipinḍotpatti 1-79 on ff. 17-22; sṛṣṭipralaya 1-91 on ff. 22-27; mlecchamatenātra bhūmisaṃsthāna 1-81 on ff. 27-30v; graharkṣamūrti 1-43 on ff. 30v-32; malamāsa 1-30 on ff. 32-34; sphuṭagativāsanā 1-9 on ff. 34-35; chedyakavicāra 1-10 on ff. 35-36; udayāstanirūpaṇa 1-19+ on ff. 36-37; grahaṇavicāra 5-21 on ff. 37-38v; (candragrahaṇa) 1-4 on ff. 38v-39; rāhuvicāra 1-13 on ff. 39-40; grahayutinirūpaṇa 1-4 on ff. 40-40v; and jyotiḥśāstrasyāmnāyamūlatra on ff. 41-49). Sūrya's source for the Mlecchamata was written in Persian.

F. 1 begins in 1, 14a: mṛgādāv atha karkyādaḥ.

Colophon on f. 49: iti śrīmaddaivajñāpaṇḍitasūryaviracite siddhāntasaṃhitāsārasamuccaye jyotiḥśāstrapurāṇavirodhaparihāro nāmādhyāyaḥ.

F. 49v. Blank.

The **BHŪGOLAPURĀṆA** in Hindī attributed to Mahādeva = Śiva. See *CESS* A5, 754a. It begins: pārabatī uvāca || om svāmī bhuvamaṇḍāṇa kā kathau pramāṇa || utpati siṣṭi kā kahau baṣāṇa ketī dharatī kitā akāsa.

Manuscript:

248. Khasmohor 570. Ff. 1-11. 10.5 × 21 cm. 13 lines.

Colophon on f. 11: iti śrībhogalapurāṇe mahādevakathite sapuraṇa || samāpata ha.

The **(BHŪGOLAVICĀRA)** on the concept of the earth in the purāṇas and in the siddhāntas. Neither the beginning nor the end is available.

Manuscript:

249. Khasmohor 5032. Ff. 2-11. 10 × 22 cm. 11/12 lines. Incomplete.

F. 2 begins: catuḥpaṇcāśan nakṣatrāṇi caturbhujastambhanibho meruḥ ekāṃtarakoṇagayor merukoṇavaśena tayor ekāṃtara evodaya iti.



F. 11v ends: atrāhus tātacaraṇāḥ yad etat yajñaliṅgasya bhagavato vāma-  
nasya baliyāṃ cāpadeśena caraṇatalacihnair dhvajavajrāṅkuśakamalasudarsa-  
nair aṃkitam adyāpi taccaraṇāṅguṣṭha.

The **GOLADARPAṆA** or **BHĀGAVATAJYOTIḤŚĀSTRABHŪ-  
GOLAKHAGOLAVIRODHAPARIHĀRA** composed in expansion of Ke-  
valarāma's *Bhāgavatajyautiṣayor bhūgolavirodhaparihāra* by Nandarāma in 1767.  
See *CESS* A3, 129a, and A5, 156b. The first verse is:

śrīmadgiridharadevaṃ  
vrajaṇahṛtkamjabhāskaraṃ vande |  
ajño 'pi yatkrpāto  
vācaspatitulyatāṃ labhate ||

#### Manuscripts:

250. Puṇḍarīka jyotiṣa 16. Ff. 1–12. 10 × 22 cm. 9 lines. A shortened  
version. Copied in 1771/2.

Colophon on f. 12: iti bhūgolakhagolavirodhaparihāraḥ samāptaḥ.

Post-colophon: saṃ. 1828.

F. 12v. Blank.

251. Puṇḍarīka jyotiṣa 15. Ff. 1–18. 10.5 × 21.5 cm. 10 lines. With marginal  
corrections and additions by a second scribe. A longer version. Incomplete.

F. 1 begins with a passage not found in manuscript 250: s tatra karma mayas-  
vapraśāśarīrāṇāṃ yakṣadevādīnāṃ vāsonakṣatrakakṣāparyamtaṃ nakṣatra-  
kakṣaiva divo mūrdhā tataḥ kāmcanī bhūmis.

Colophon on f. 18v: iti bhūgolakhagolavirodhaparihāre goladarpaṇanāmakam  
grantha sampūrṇam.

The **VIRODHAMARDANA** composed in 71 Sanskrit verses by Yajñeśvara  
Joṣī at Pune in 1836. See *CESS* A5, 319a, and A6. The first verse is:

īśvaraṃ kevalaṃ naumi vicitrānekaśaktikam |  
jagatsarjanasaṃsthānatirobhāvādikāraṇam ||

#### Manuscript:

252. Museum 205. Ff. 1–16. 15 × 20.5 cm. 14 lines. On English water-  
marked bluish paper. Each sheet is 29.5 × 20.5 cm., and is folded in half. With  
Yajñeśvara's own Marāṭhī ṭīkā. Copied in 1836/7.

Colophon on f. 16: iti jyotirvidyayajñeśvaraviracito virodhamardananāmā gra-  
mthaḥ samāptaḥ.

The *ṭīkā* ends on ff. 16–16v: *yā pramāṇe yajñeśvarajoṣī puṇekara yāñi prākṛtabhāṣeṇeṃ kele svakṛta*[f. 16v]*virodhamardanaprakāśa yānāve vivaraṇa samāpta.*

Post-colophon: *miti śake 1758.*

The **VIRODHAMARDANAVIVARAṆA**, a commentary on his own *Virodhamardana* composed in Marāṭhī by Yajñeśvara Joṣī at Pune in 1836. See *CESS* A6. It begins: *hā virodhamardana yānāce navīna gramtha va prākṛtabhāṣenetyā ce vivaraṇa puṇekara yajñeśvara joṣi | yāñi kele śake 1758.*

See manuscript 252.

## J. TRANSLATIONS

Theodosius wrote the *Σφαιρικά* in about the first century B.C. This was translated into Arabic as the *Kitāb al-ukarr* by Qusṭā ibn Lūqā in the late ninth century and corrected by Thābit ibn Qurra. A *Tahrīr al-ukarr* based on this translation was completed by Naṣīr al-Dīn al-Ṭūsī in 1253.

The **UKARA**, a translation of Naṣīr al-Dīn's *Tahrīr al-ukarr* completed by Nayanasukhopādhyāya at Jayapura in 1729. *CESS* A3 132a; A4, 122a; and A5, 159a. Edited by V. Bhaṭṭācārya as *SBG* 104, Vārāṇasī 1978. It begins in the Jaipur copy: atha ukārākyo grāṁthaḥ sāvajūsayūsakṛto likhyate || tatrā'sya trayo dhyāyā ekonasaṣṭitulyāni 59 kṣetrāṇi saṁti || paraṁ ca kvacit pustake ṣṭa-paṁcāśa58nmitāny eva kṣetrāṇi saṁti || tatra prayojanadvayasyaikakṣetram eva kṛtaṁ || idaṁ yūnānībhāṣātaḥ arababhāṣāyāṁ abula avvāsa ahamadasyajñayā kustā vini lūkā bālbakvī saṁjñena tṛtīyā'dhyāyasya pañcamakṣetraparyantaṁ grathitaṁ śeṣaṁ anyair grathitaṁ || idaṁ sābita vini kusai saṁjñena śodhitaṁ || naṣīrasaṁjñena ṭikā kṛtā || seyaṁ saṁskṛtaśabdair nibaddhyate.

Manuscript:

253. Museum 44. 1 blank folium; ff. 1-46; and 3 blank folia. 23 × 17.5 cm. 23 lines. Writing parallel to the shorter edge. Bound in cloth. Copied (by Lakṣmīdhara Lekhaka) on Thursday 23 October 1729. Acquired for Jayasimha's library in 1730.

Colophon on f. 46: ity ukaraṁ sāvajūsayūsasaṁjñasya samāptaṁ. asmin adhyāyatrayaṁ ekonasaṣṭi59kṣetrāṇi saṁtīti.

Post-colophon: saṁ 1786 kā śukla 13 gurau || samāptaś cā'yaṁ grāṁthaḥ.

On f. 46v is written: idaṁ ārabībhāṣāta āvidasaṁjñaiḥ kathitaṁ na(ya)na-sukhopādhyāyaiḥ saṁskṛte grathitaṁ.

Ptolemy composed the *Σύνταξις μαθηματικὴ* in about 150. It was translated into Arabic by Ishāq ibn Hunayn and corrected by Thābit ibn Qurra. On the basis of this Naṣīr al-Dīn al-Ṭūsī completed the *Tahrīr al-Majistī* in 1247.

The **SAMRĀṬSIDDHĀNTA**, a translation of the *Tahrīr al-Majistī* completed by Jagannātha Samrāt for Jayasimha in 1732. *CESS* A3, 57a-58a; A4, 95a; and A5, 114a. Edited by R. S. Sharma, 2 vols., Nai Dillī 1967. The first seven verses are:

gaṇādhipaṁ surārcitaṁ samastakāmadam nṛṇām |  
praśastabhūtibhūṣitaṁ smarāmi vighnavāraṇam ||  
lakṣmīnṛṣiṇhacaraṇāmburūhaṁ sureśair  
vandyam samastajanasevitareṇugandham |  
vāgdevatām nikhilamohatamopahantrīm  
vande guruṁ gaṇitāsāstraviśāradam ||  
śṛigovindasamāhvayādivibudhān vṛndātavīnirgatān  
yas tatraiva nirākulaḥ śucimanobhāvaḥ svabhaktānayat |



mlecchān mānasamunnatān svatarasā nirjitya bhūmaṇḍale  
 jīyāc chrījayasimhadevanṛpatiḥ śrīrājarājeśvaraḥ ||  
 rājādhirājo jayasimhadevaḥ śrīmatsyadeśādhipatiś ca samrāt  
 śrīrāmapādāmbujasaktacitto yajvā sadā dānarataḥ suśīlaḥ ||  
 golādiyantrēṣu navīnayuktipracāradakṣo gaṇitāgamajñaḥ |  
 satyapriyaḥ satyarataḥ kṛpāluḥ tigmapratāpo jayati kṣamāyām ||  
 sa dharmapālo gaṇitapravinān jyotirvido golavicāradakṣaṇ |  
 kārūṃs tathāhūya cakāra vedhaṃ golādiyantrair dyusadāṃ ca bhānām |  
 granthaṃ siddhāntasamrājāṃ samrāt racayati sphuṭam |  
 tuṣṭyai śrījayasimhasya jagannāthāhvayaḥ kṛtī ||  
 arabībhāṣayā grantho mijastīnāmakaḥ sthitaḥ |  
 bālakānāṃ subodhyāya gīrvāṇyā prakṛtikṛtaḥ ||

asya granthasya trayodaśādhyāyāḥ santi | ekacatvāriṃśadadhikaśataṃ  
 prakaraṇāṇi santi | ṣaṇṇavatyuttaraśataṃ kṣetrāṇi santi ||

Manuscript:

254. Pothīkhānā 183. Part I. Ff. 1–75, 75b–115, 117–144, 144b–160, 161/2, and 163–210 (text continuous). Part II. Ff. 212–285, 266 (=286) and 287–427 (text continuous). 19 × 40.5 cm. 12 lines.

The first part of the manuscript contains Jagannātha's translation of Naṣīr al-Dīn's *Tahrīr kitāb uṣūl al-handasa* based on the Arabic version of Euclid's *Στοιχεῖα*. With marginal notes.

Colophon on f. 210: iti śrīrekhāgaṇite pañcadaśo dhyāyāḥ samāpto yaṃ granthaḥ.

The second part of the codex contains Jagannātha's *Samrāṭsiddhānta*. Spaces for diagrams left blank. Incomplete.

F. 212 begins in *Samrāṭsiddhānta* 1, 1 (vol. 1, p. 17, 7): dviguṇaḥ 7200.

F. 300. Blank.

F. 427 ends in 11, 10 (vol. 2, p. 940, 5): aṃśāṃtareṇa li.

F. 427v. Blank.

We were unable to examine manuscript 32 in the Reserved Collection, which contains the *Samrāṭsiddhānta* and the *Rekhāgaṇita*.

Al-Zarqāllu wrote several works in Arabic on the safiḥa at Toledo in about 1050 to 1075; these include the following.

The **JARAKĀLĪYANTRA** or **SARVADEŚĪYAJARAKĀLĪYANTRA** is based on a description of the universal astrolabe written in either Arabic or Persian; in its beginning it is close to the first chapter of the text published by R. Puig in *Los Tratados de Construcción y Uso de la Azafea de Azarquiel*, Madrid 1987, but afterwards diverges. It has been tentatively suggested that it was translated by Nayanasukhopādhyāya; see *CESS* A5, 159a–159b. Since it was incorporated by Jagannātha into the second version of his *Siddhānta-kaustubha* (pp. 96–105 of the *Siddhāntasamrāt* edited by M. Caturveda, Sāgara

1976), the text was known in Jayasimha's court before 1730. The text begins: *atha jara-kāliyamtram likhyate || prathamam abhiṣṭam vṛttam kāryam || tad bhāṁsāṅkitam pūrvāpararekhāṅkitam ūrdhvādhararekhāṅkitam ca kāryam.*

Manuscripts:

255. Khasmohor 5483. Ff. 1-9, (10), 11-12, and (13), and 3 blank folia. 20 × 15 cm. 16 lines. Writing parallel to the shorter edge. Copied by a scribe whose script is similar to Kṛpārāma's.

F. 13 ends: *atha svadeśalagnajñānāt anyadeśalagnajñānam āha || deśāntarāṁsān khalagnaviṣuvāṁsān saṁyojya lagnam sādhyam || yadi anyadeśaḥ svapūrvato bhavati yadi paścimataḥ tadā antaram kṛtvā lagnam sādhyam.*

256. Puṇḍarīka jyotiṣa 28. Ff. 1-8. 9.5 × 32 cm. 8 lines. Ff. 4 and 8 colored yellow. With some marginalia. Incomplete.

F. 8v ends, in the middle of line 7: *atha svadeśalagnajñānāt anyadeśalagnajñānam āha || deśāntarāṁsān sva-*

Below this is written: *siddhāntaśekhara ||*

*ādye pade (')pacayanī palabhālpikā syāt  
chāyālpikā bhavati vṛddhimatī dvitīye ||  
akṣadyuteḥ samadhikopacitā tṛtīye  
turye punaḥ kṣayavatiḥ tadanalpikā(ā)[ṁ] ca || 1 ||  
vṛddhiṁ prayā(ṁ)tī yadi dakṣiṇāgrā  
chāyā tathāpi prathamam padam syāt ||  
hrāsam vrajantīm atha tām vilokya  
raṇ vijānīhi padam dvi(tīyam || 2 ||)*

These are Śrīpati. *Siddhāntaśekhara* 4, 70-71.

Naṣīr al-Dīn al-Ṭūsī was the author of a popular treatise in Persian on the astrolabe; it is entitled *Bīst bāb dar usturlāb* or *Risālat al-usturlāb* and was probably composed in the 1240's.

The **YANTRRĀJASYA RASĀLA** called the **VĪSAVĀVA**, a translation of Naṣīr al-Dīn's *Bīst bāb*, was made by an unknown scholar; a note by a second hand at the end of Benares 81865 states: *iti nayanasukhopādhyāya-kṛtayantrarājavicāraviṁśādhyāyī ārabītaḥ saṁskṛtanitā.* If true, this would indicate that the translation was made from an Arabic version of the original. Some probability is lent to this story by the fact that the manuscript in the Jaipur Museum was copied by Kṛpārāma who copied Nayanasukha's translation of Naṣīr al-Dīn's *Tadhkira* in 1729. See *CESS* A3, 145a; A4, 125a; and A5, 159a. Edited by V. Bhaṭṭācārya as *SBG* 115. Vārāṇasī 1979. It begins: *tatra paribhāṣā | tatra yantrāntargatakhaṇḍāni rekhāvṛttāni ca yāni santi teṣāṁ samjñā procyate.*

## Manuscripts:

257. Museum 42. 2 blank folia; ff. 1–28; and 2 blank folia. 22 × 16.5 cm (folia 22 × 33.5 cm folded in half). 16 lines. Bound with string to the left. Writing parallel to the shorter edge. Copied by Kṛpārāma in ca. 1729.

Colophon on f. 26: iti viṃśatimo dhyāyaḥ || 20 || ☉ || yaṃtrarājasya rasāleti visavāvasaṃjñako samāpto yaṃ graṃthaḥ.

Post-colophon: li. kṛpārāmeṇa.

Ff. 26v (originally) and 27–28v. Blank.

258. Puṇḍarīka jyotiṣa 12. Ff. 1–4 and 4b–23. 12 × 27 cm. 10 lines. With marginal corrections by a second scribe. Copied on Friday 28 November 1788 for the Puṇḍarīkas. Formerly property of Viśveśvara, the son of Rāmeśvara.

F. 4, line 9 ends in 3, 3 (p. 5, 11): punaḥ krāṃtivṛtta.

F. 4b, a śodhapatra, contains from there: sya tadagrīmasūryāṃśam to, on f. 4bv, 3, 4 (p. 6, 2): krāṃti.

F. 4, line 10 picks up from 3, 4 (p. 6, 2): vṛttasya.

Colophon on f. 23: iti viṃśatitamā 'dhyāyaḥ | 1 || iti yavanabhāṣāyāṃ yaṃtrarājasya rasāleti visavāvasaṃjñakāḥ samāptaḥ.

Post-colophon: saṃvat || 18 | 45 || likhitaṃ śukravāre mārgaśīrṣasudī | 1 || idaṃ puṇḍarīkāṇām.

F. 23v. Blank.

Ownership note on f. 1:

rāmeśvaratanūjasya viśveśvaravipaścitaḥ ||  
yaṃtrarājaparibhāṣā pustakaṃ varttate śubham || 1 ||

Naṣīr al-Dīn completed his *Tadhkira fī 'ilm al-hay'a* in Arabic in 1261; he published a revised version in 1274. This was commented on by 'Alī al-Birjandī in 1507.

The ŚARAHATAJKIRĀ VIRJANDĪ, a translation into Sanskrit of chapter 11 of book II of Naṣīr al-Dīn's *Tadhkira* with al-Birjandī's *Sharḥ* completed by Nayanasukhopādhyāya assisted by Muḥammad Ābidda on Tuesday 16 December 1729. See *CESS* A4, 122a. Edited by T. Kusuba and D. Pingree as *IPTS* 47, Leiden 2002. It begins: atra grahagatau yāni vastūni kṛtānatarāni saṃdigdhāni saṃti || tadupapāḍakayuktayo nirūpyante.

## Manuscript:

259. Museum 46. Ff. 1–56. 20.5 × 16 cm. 16/17 lines. Bound in cloth. Writing parallel to the shorter edge. Copied by Kṛpārāma. Acquired by the Jayapura library in 1730.

Colophon on f. 56v: idaṃ naṣīratūsīkṛtatajkarāgraṃthasya vyākhyāne mulā alī virjandīkṛte ekādaśaprakaraṇaṃ halli mā lāyana halla saṃjñāṃ samāptaṃ



|| idaṃ mahammadāviddasamjñai kathitaṃ nayanasukhopādhyāyaiḥ saṃskṛta-śabdair nibaddhaṃ || saṃvat 1786 śā 1651 pauṣaśukla 8 bhaume samāptim agamat.

Post-colophon: kripārāmeṇa lipikṛtaṃ.

Jamshīd al-Kāshī completed the *Zīj i Khāqānī* in Persian for Ulugh Beg at Samarqand in 1413/4.

The **VAKRAMĀRGAVICĀRA**, a translation of the chapter on planetary retrogression in the ninth chapter of al-Kāshī's *Zīj i Khāqānī*. See *CESS* A6. It begins: atha vakramārgavicāraḥ khākānījīcasya navamādhyāyastho nirūpyate || tatra nīcoccavṛttakeṇdragatyā bhūkeṇdre ye koṇā utpatsyaṃte teṣāṃ koṇā-nāṃ yat pramāṇaṃ saiva maṇdaspaṣṭagatir asti.

Manuscript:

260. Museum 33. Ff. 1–11 and 3 blank folia. 23.5 × 16.5 cm. 19/20 lines. Bound in red cloth with a Persian flap. Writing parallel to the shorter edge. Said to have been copied by Lakṣmīdhara Lekhaka of Sarakāra.

F. 11 ends, in the middle of line 12: evaṃ karṇebhyo gaṇitaṃ kṛtvā śīghragatayaḥ sārīnyāṃ likhitāḥ.

F. 11v. Blank.

Ulugh Beg of Samarqand sponsored the composition of the *Zīj i Jadīd* in Persian, which was completed after 1437/8.

The **ULAKABEGĪJĪCA**, a Sanskrit translation of Ulugh Beg's *Zīj i Jadīd* or at least of its tables.

Manuscripts:

261. Museum 45. Ff. 1–77, 77b–87, and 89–100 (text continuous). 17 × 28.5 cm. Tables only: the entries are in Nāgarī numerals, the headings usually in Persian, but occasionally in Sanskrit. Brought from Surat by Nandarāma Jośī. The price was 20 1/2 rūpīs.

Statement on f. 100v: ulakabegījīca sūratate āiṃ māraphata naṇdarāma jośī. kīmata bīsa rūpai ai 20S.

262. Khasmohor 5484. 10 ff. 23.5 × 15.5 cm. Long leaves folded at the top. Writing parallel to the shorter edge. The tables for the Moon only.

F. (1). A comparison of Ulugh Beg's lunar paramaters with those of the *Zīj i Shāhjahānī*. it begins: pākṣakeṇdras tu sarveṣāṃ mate ekaiva || ulgavegī śīghrakeṇdre rāśyādi 3|20|35|0 hīnaḥ jāto śāhajahānī śīghrakeṇdraḥ ulgavegī madhyame 3|26|12|32| hīnaḥ jāto śāhajahānī madhyamacandraḥ.

F. (1v). Table of the mean motions of the mandakendra (double elongation), ſighrakendra (anomaly), madhyama, and rāhu from A.H. 841 to 871 = A.D. 1437/8 to 1466/7.

F. (2). Table of mean motions for 30 to 300 years in steps of 30 and for 600, 900, and 1200 years.

Table of mean motions for the months of the Muslim calendar: mūharam, saphara, ravalavala, ravila āṣira, jamādilāvala, jamādala āṣira, rajjaba, śābāna, ramajāna, śavāla, jilkāda, jilhijja, and muharram.

F. (2v). Table of mean motions for 1 to 31 days.

Ff. (3–3v). Table of mean motions for 1 to 60 hours.

F. (4). Deśāntara for 1° to 60° from Samakaraṇḍa, whose tūlāṃśāḥ are said to be 99;16.

Ff. (4v–5). First lunar equation for 0° to 359°.

F. (5v). Second lunar equation for 0° to 179° down and 180° to 359° up.

F. (6). Second lunar equation at closest distance.

F. (6v). Sexagesimal parts.

F. (7). Table for evection.

F. (7v). Sexagesimal parts reversed.

F. (8). Equation of daylight.

Ff. (8v–9v). Table of the Moon's latitude.

F. (10). Table for reducing the longitude of the Moon in its orbit to its ecliptic longitude.

A Sanskrit version of Ulugh Beg's star-catalogue with the longitudes increased by 4;8,41°, which is the precession for the 290 solar years between 1437 and 1726 at the rate of 1° in 70 years, which was Ulugh Beg's rate as well as that of earlier Muslim astronomers. The names of the constellations and of the individual stars are translated from Persian into Sanskrit; some Persian names and phrases also are transliterated into Nāgarī. There are nine columns:

1. Serial numbers of all the stars (1 to 1018).
2. Serial numbers of the stars in a given constellation.
3. The names or descriptions of the stars.
4. The longitudes in signs, degrees, minutes, and seconds.
5. The latitudes in degrees and minutes.
6. The direction of the latitude.
- 7 and 8. The magnitudes of the stars.
9. The planets associated with the stars, where appropriate.

Manuscript:

263. Puṇḍarīka jyotiṣa 20(b). Ff. 1–44 and (45–46). 13 × 26.5 cm.

F. 1 begins: uttarasthitalaghubhallūkamūrtitārāḥ 21 uttarasāra 21 surati dubbe asagara.

After the stars in each constellation is a summary. In these summaries are often given the opinions of vana sūphī (Ibn al-Sūfī) and of Batlamajūsa (Ptolemy).

F. 42v ends with star 951, which is the 20th in the constellation ketūrasa || manuṣyamukha || aśvajaghana || catuspāda (Centaurus).

Ff. 43–(45v). The numbers in column 1 are 952 to 1018, and the numbers of the stars in each constellation are given, but the names and descriptions of individual stars generally and the summaries are omitted; columns 4, 5, 7, 8, and 9 are filled in (column 6 is left blank since all of these stars have southern latitudes). The constellations and the number of stars in each in this section are:

(Centaurus) 21 to 37

savo || vrak || huṃḍāra (Lupus) 1 to 19.

majamar || agnipātraṃ (Ara) 1 to 7.

ikalīl || chatratārā (Corona australis) 1 to 13.

kavākiv hūte janūvī || ekamatsya (Piscis austrinus) 1 to 11.

Ff. (45v–46). Some stars from the northern constellations—dube asagara || laghu bhalūka (Ursa minor), dubbe akabara || mahad bhallūka (Ursa maior), and tinnin ajagara (Draco)—are repeated.

A catalogue of stars of the first, second, and third magnitudes. Their names are in Sanskrit, their longitudes are Ulugh Beg's precessed to 1726 and given in signs, degrees, and minutes; their latitudes are Ulugh Beg's with directions noted; and their magnitudes are in general Ulugh Beg's. The Sanskrit names of several hundred identifiable stars, at least as used in Jayapura under Jayasinha, are uniquely preserved in this document.

Manuscript:

264. Puṇḍarīka jyotiṣa 21. ff. 1–4 and 1 blank folium. 12 × 27 cm.

F. 1. Heading: samvat 1783 śāke 1648 krāntivṛttasthadrurvākāḥ sāyanāḥ samadhyasārāś cālītāḥ

F. 4v. Conclusion:

puraiva pūrvair bhujanetradigbhi1022s  
tulyāni bhāni praviśodhitāni ||  
vedhoktayamtraṇ punar evam eva  
grhītavān vatlamayūsanāmā || 1 ||  
mijastakākhye nijapustake (')pi  
lilekha bhūyo rasamānakāni ||  
tāny eva tatrādhikabimbam rksam  
yat tad vadamti prathamapramāṇam || 2 ||  
saṣṭhapramāṇam paramāṇubimbam  
punas tridhā syāt pratimānam etat ||  
krameṇa pūrvadvitṛtiyabhedair  
atha pravakṣye (')khilatārakotthāḥ || 3 ||



It is curious that these verses refer to Ptolemy's catalogue of 1022 stars in the *Almagest* rather than to Ulugh Beg's catalogue of 1018 stars in the *Zīj i Jadid*, which was the compiler's source.

ʿAlī al-Qūshjī composed a *Risālah dar hayʾat* in Persian for the Sultān Muḥammad ibn Murād at Istanbul in about 1470.

The **HAYATAGRANTHA**, a Sanskrit translation of al-Qūshjī's *Risālah dar hayʾat* executed probably in the seventeenth century. See *CESS* A4, 57a–57b, and A5, 43b. Edited in a contaminated version by V. Bhaṭṭācārya as *SBG* 96, Vārāṇasi 1967. It begins: atha hayatagrantho likhyate | tatrādaṁ saṁjñādhyāyaḥ madhye ʾdhyāyadvayaṁ ante prakīrṇakaḥ.

#### Manuscript:

265. Museum 24. 1 blank folium, ff. 1–60, and one originally blank folium. 20 × 16 cm. 15–17 lines. Bound in cloth. Writing parallel to the shorter edge. Copied (by Tīkārama according to a note on the recto of the last folium) in 1728/9.

F. 60v ends, in the margin, at the end of the text, but at a damaged edge (p. 142, 9–10): yadi chāyā (pūrve tadā) kivalā paścī(me ʾsti) chāyā (paścime) tadā (kivalā pūrve ʾsti).

Colophon on the verso of the first blank folium: iti śrīhayatasamjñō graṁthaḥ samāptaḥ.

Post-colophon: samvat 1785 śāke 1650.

Farīd al-Dīn Masʿūd ibn Ibrāhīm Dihlawī completed his *Zīj i Shāhjahānī*, whose epoch was the year of Shāh Jahān's accession to the Imperial throne, 1628, shortly before his death in Delhi on 20 October 1629. It was based on the *Zīj i Jadid* of Ulugh Beg.

The **SIDDHĀNTASINDHU**, a translation of Farīd al-Dīn's *Zīj i Shāhjahānī* undertaken by Nityānanda at the command of Āsaf Khān and completed in about 1635. See *CESS* A3, 173b, and A5, 184a. The first verse is:

siddham sādhyam idaṁ vidher api jagad yac cetasi dhyāyate  
yat smṛtvaiva purāpurāṇapurūṣo ʾpicchāvatārān dadhau |  
yaj jyotiḥ paramaṁ nidhāya hṛdaye tepe tapo ʾpīśvaras  
tasmai māṅgalamūrtaye trivibudhārādhyāika tubhyaṁ namaḥ ||

#### Manuscripts:

266. Khasmohor 4960. Ff. 1–443, 3 ff., and ff. 444. Foliation in both Nāgarī and Persian. 42.5 × 27.5 cm. 28/29 lines. Writing parallel to the shorter edge. Bound as a Persian book. Some folia damaged by water. With marginal notes.

The tables end on f. 441, which was originally the last folio of the manuscript. It belonged once to the Emperor Shāh Jahān: his seal appears on f. 1.

In 1717 it belonged to Pīthinātha: the horoscope of his son is written on f. 443; it is dated Thursday 10 October 1717 according to the inscription: samvat 1774 sāke 1638 tatra varṣe kṛttikakṛṣṇa 1 guru ghaṭī 14 pala 18 bharanī ghaṭī 44|7 sīdha ghaṭī 36|7 caṇḍratāriṣa 15 rātraśeṣaghaṭī 11 upari pīthināthagrahe putrajanma śubhaṃ. The date is confirmed by the horoscope.

Planets	Text's longitudes (sidereal)	Computed longitudes (tropical)
Saturn	Libra	214°
Jupiter		150°
Mars	Capricorn	182(!)
Sun	Libra	208°
Venus	Scorpius	
Mercury	Libra	
Moon	Aries	176(!)
Rāhu	Virgo	183°

Acquired for 250 1/2 rūpas from Manasārāma according to a note (by the Jayapura librarian?) on f. 443: pothī jīca syājihānī vācata nityānaṇḍa māraphata manasārāma [ma]baidakī motatīnī kimata ru° 250 S patra 441. This acquisition is dated 1696 by a note on f. 444: pauthī jīca syājihānī vā° nītānaṇḍa mā° manasārāma vaidakī motatīnī yitī bhāḍavā sudī 6 dītavāra samvat 1753 kimatī ru° 250 S.

Ff. 442 and 443 have mathematical rules and notes: a prastāra on f. 442. On the verso of the first unnumbered leaf after f. 443 is a geographical list in Persian in two columns of which each is divided into three sub-columns.

ṭūl wa ʿard baʿd az buldān bi-hindūstān

al-buldān	ṭūl	ʿard
amarkut	105:0	25:0
akbarābād	115:0	26:43
kawil	114:19	28:20
hānsī	112:25	29:45
ḍawlatābād	111:0	20:35
fathpūr sīkrī	115:46	26:0
ajmīr	111:5	26:0
burhānīpūr	118:0	20:40
ujayn	112:30	30:0
ḍānūl?	115:50	17:40
bijāpūr	110:20	16:32
aḥmadābād	118:40	23:15
kanbāyat	119:20	26:20

dākah bangālah	123;0	27;0
kūj bangālah	122;0	31;0
gawr bangālah	122;45	26;12
māndū	112;0	23;0
gwāliyar	114;0	26;29
aḥmadnagar	117;0	29;0?
lakhanaw	114;53	26;30
awdah	118;50	27;22
jawnpūr	119;50	26;36
siyālkūt	109;0	33;0
gawpāmaw	116;33	26;45
kurah?	118;10	26;49
mānikpūr	118;10	26;49
māhūrah	116;40	24;40
tahānīsīr	112;38	30;10
pānīpat	113;20	28;52
badā'ūn	114;59	27;32
baran	114;0	28;48
sunnām	112;22	30;30

jamlah samī wa dū? baldah sanah 16(?) shad kātīb al-ʿabd shāh maḥmūd bayādkārī qalam ...fi sanah 1072. A.H. 1072 = A.D. 1661/2.

Column 2.

banāras	117;20	26;15
dabīl yuʿanā tattah	102;30	25;10
manṣūrah qaṣbah sind	105;0	27;40
mā'ah az sāhil bahr hind	102;0	19;20
nahrwālah gujarāt	102;30	22;0
sawmnāt	106;0	17;0
multān	107;35	29;40
qandahār	107;40	33;0
lahāwar	109;20	31;50
qannawj dār mulk hind	115;50	25;35
sarāndīb	130;0	10;0
tubbat	110;0	40;38
kashmīr	108;0	35;0
dihlī	113;35	28;39

A geographical list on the recto of the second unnumbered folio after f. 443:

akṣaṁśa	
laṅkāyām	0 0
ādine	11



tilaṅge	18
alaṅguhyāṃ	18 10
gaṅgāsāgara	18 20
havase	18 30
devagirau	20 34
aṃvaka saṃmā	18 5
maṇabhavasānikāyāṃ	21
makāra	1 20
śṛbhṛgukacha, naṃdapatra, vaṭapatra, śṛistaṃbhatīrtha, dhavalake, āsīmalyāṃ	22
somanātha pattane, maṅgalāpurā	22 15
raivatakāvale	22 35
ujayinyāṃ	23
dhārāyāṃ	23 30
siddhanagare, nomodeva, purocyāṇa, nilapurapattane	24
nalasṭanamda	5
ajamera	26 22
nāgaura	26
vāṇarasyāṃ	26 15
laṣaṇāvatyāṃ	26 20
kaḍānagare	26 29
karnakujve	26 35
mānikasṭate	26 49
tādrabhakte	27
jājnagare, udisānagadra	27 5
ajodhyāyāṃ	27 27
gopālapura	27 29
būṃdīnagare	27 37
gopāmau	27 45
kolajalālyāṃ	28 4
kāmpilā	28 10
śivasthāne	28 15
udyamulatāne	28 20
vatanagare	28 28
yoginipure	28 35
daruhitaka	28 45
mena+	39
mulatāne	29 4
....(one line lost)...	
kurukṣetre	30 10
kapilasthāne, jālaṃdhare, bhunābhasabhāṇā	37 37
deyālapura	31
ramāhora bhāṃdhota	31 50
vadamstyāṃ	35
vūya	36 25
dāmagā	35 30

pāṃsaja	36 40
kāśmīra	37
valaka	39
samarakaṇḍa	40

On the verso of this same folio is a list, it appears, of recipients of copies of the *Siddhāntasindhu* (A); it is found also on f. 443v of manuscript 267, here denoted B.

A	B
jīca mūlakarī su pālīsāha kai	jīcamūlakarī su pātīsāhake
kitābaṣān nemāhi hai	kitāvaṣāṃ neṇmāhi he
1 bagāle ājama ṣa ko dai	1 vagāle ājama ṣāṃ ko dai
1 paṭanai abdallahaṣā ko dai	1 paṭaṇe avdullaha ṣāṃ ko dai
1 banarsī dai sāhava sūve ko	1 vanārasī dai sāhava mūve ko
1 dillī itakāda ṣa ko dai	1 dillī itakāda ṣāṃ ko dai
1 ujjayāni ṣa jadaura ko nayaśarīpha	1 ujjayaṇa ṣāṃ nadorā ko navaśerī ṣāṃ
1 burhānapura mahāvala ṣa khānākhānā	1 burahānapura mahāvata ṣa khāṇnakhāṇnā
1 lahauri ujīra ṣa	1 lāhori ujīra ṣāṃ
1 kāśmīra japhara ṣa	1 kaśmīra japhara ṣāṃ
1 multāna	1 mulatāna
1 nityānaṇḍa	1 nityānaṇḍa
11 jamā	11 jamā

267. Museum 23. Ff. 1–171, 171/172, and 173–444. 45.5 × 32.5 cm. 29 lines. Writing parallel to the shorter side. Bound to the left. Ff. 341–348 bound in upside down and backwards. With marginal notes. Copied by Gaṅgārāma of Kāśmīra for Jayasiṃha on Thursday 6 April 1727.

F. 441 ends with a table entitled *yogacālakāt phalaṃ*.

Ff. 441v–442. Blank.

F. 442v. A *prastāra*.

F. 443. Mathematical texts.

F. 443v. List as on the verso of the second unnumbered folio after f. 443 of manuscript 266.

F. 444. Blank.

Date formula on f. 443:

śubh(am) astu sarvajagatāṃ parahitaniratā bhavaṃtu bhūtagaṇāḥ  
 doṣaḥ prayāṃtu śāntiṃ sarvatra sukhībhavaṃtu lokāḥ || śrīḥ ||  
 samvat 1784 vai vadi 11 gurvāre madhyāhnasamaye idaṃ  
 nityānaṇḍajīcapustakaṃ samāptim agamat || śudhaṃ ||  
 mayedaṃ gaṅgārāmeṇa kāśmīreṇaiva vāsina

likhitam kāyakaṣṭhena nityānamdajīcapustakam 1  
yādṛśam pustakam dṛṣṭvā tādṛśam likhitam mayā |  
yadi śuddham aśuddham vā mama doṣo na vidyate 2

śrīrājājayasiṃhena idam pustakam likhāpitam paropakārārtham.

On f. 444v is a Hindī note indicating that Nityānanda's zīj in 444 folia was copied by Gaṅgāyaratna on ca. 24 May 1726: pothī hīdagī jīcakī mai pānā 444 liṣī gaṅgāyaratneṇa karkā jīca nītānamda vālikī ... jethasudi 5 saṃvata 1783.

268. Khasmohor 4961. Ff. 1–59, (60), 61–303, and (304–440). 45 × 33.5 cm. 24–27 lines. Writing parallel to the shorter edge. Bound to the left.

F. 28 ends (see f. 443 of manuscript 267):

śubham astu sarvajagatām parahitaniratā bhavaṇtu bhūtagaṇ(ā)ḥ ||  
doṣāḥ prayāṇtu śāntim sarvatra sukhībhavaṇtu lokāḥ || 20 ||

The rest of the manuscript contains tables.

269. Khasmohor 4962. Ff. (2), 4–48, (49), 50–55, (56), 57–63, (64), 65, (66), 67, (68), 69–78, (79), 80–87, (88), 89–92, (93), 94, (95), 96, (97), 98–279, (280), 281–314, (315), and 316–436. 37 × 25 cm. 21–30 lines. Many folia torn; heavily repaired. Writing parallel to the shorter edge. Bound to the left. Incomplete. Acquired by Jagannātha Joṣī for rūpas 100.

F. (2) begins in 10a: svalpaprasādād.

F. (2v) ends: || 25 || āṇu + + + + mi taṃtraṃ yavanoktiyukti + + + rat kimai.

F. 4 begins: atha yavanoktamaṅgalācaraṇādilikhanam || tasya viśvakarttur apāramahimā tadyogyo stī.

F. 436v ends in the star-catalogue with number 1018; there are no names, but just coordinates for stars 844 to 1018.

On the first fly-leaf is the note: pothi siddhāntasiṃdhukī patra 436 mārāphata joṣī jagannāthakī sum lī kimata rū 100.

The **YANTRAPRAKĀRA** composed for Mahārājādhirāja Jayasiṃha, perhaps at Delhi, in ca. 1729; in part it is based on Naṣīr al-Dīn's *Tahrīr al-majistī*, later translated into Sanskrit by Jagannātha Samrāt. See *CESS* A5, 118a. Edited by S. R. Sarma, New Delhi, 1986–1987. It begins: atha śrīmahārājādhirājaviracitayantrāṇaṃ prakāraḥ likhyate. There follows an anukramaṇikā, and then: atha śrīmahārājādhirājaviracitayantrāṇi likhyante | tatrādau jayapra-kāśayantram likhyate.

Manuscripts:



270. Museum 31. A. 10 leaves. Ff. (1v-7) paginated 1-12; ff. (7v-10) blank. B. 22 leaves of which ff. (1v-2v), (17-18), and (22v) are blank. Two extra folia, C and D, are inserted after f. (18v). The resulting 20 leaves are paginated 14-53, of which C has pp. 42 and 43 and D pp. 44 and 45. Each pair of leaves is a single sheet folded in half. A and B: 22 × 16 cm. 25-27 lines. C: 11.5 × 23.5 cm. D: 15 × 32 cm. Writing parallel to the shorter edge. Bound to the left.

Pp. 1-12 contain from the *anukramanikā* through 1.8 (p. 21).

Pp. 14-21 contain 1.9 through 1.17 (p. 26) and part of 3.2-3.3.

Pp. 22-27 contain 2.1 through 2.9 (pp. 28-33).

Pp. 27-30 contain 3.4 (pp. 115-116).

P. 31 contains 3.5 (p. 117).

Pp. 32-36 contain the rest of 3.2 (pp. 105-110).

P. 37 contains 1.19 (pp. 27-28).

Pp. 38-40 contain the rest of 3.3 (pp. 111-114).

P. 41 contains 3.1 (p. 104).

Pp. 42-43 contain 3.6 (pp. 118-119).

Pp. 44-45 contain 3.7 (pp. 120-121).

Pp. 46-53 contain 2.10 through 2.12 (pp. 33-39).

271. *Puṇḍarīka jyotiṣa* 44(b). Ff. 1-21 and (22). 10.5 × 21.5 cm. 9-11 lines. Incomplete.

F. 14 ends. toward the end of line 2, in 1.9 (p. 22, 4): *vahisthaṃ*.

F. 14v. Blank.

F. 15 begins in 1.15 (p. 24, 22): *pañcadaśaghaṭikāś*.

F. 17v, lines 9-10 end in 1.17 (p. 26, 17): *samabhūmibhāge*. In margin after this: *atra trutiḥ*. The text continues in 2.10 (p. 34, 13): *vitribhakāle*.

F. 18, lines 4-5 have the end of 2.10 (p. 34, 19-20): *nakṣatranataghaṭikā-jñānaṃ*. The text continues with 1.18 (p. 27, 2): *atha sarvadeśīyakapālayaṃ-trocyate*.

F. 19, line 6 has the end of 1.18 (p. 27, 32): *bhavatīti dik*. The text continues with 2.11 (p. 34, 22): *atha vitribhatulyacandraśya*.

F. (22) ends, at the beginning of line 9, in 2.11.1 Ex (p. 36, 2): *svodayāṃ*.

F. (22v). Blank.

Philippus de La Hire (1640-1718) published his *Tabulae Astronomicae* at Paris in 1702. This was reprinted at Paris in 1727. A copy of this second edition was brought to Jayapura by Father Manuel Figuereido on his return from Portugal in November 1730.

The **TABULAE ASTRONOMICAE** of Philippus de La Hire were transcribed from the Latin edition of 1727 by Joseph du Bois, who complete this task at Jayapura on 10 September 1732 according to the inscription on the title page: *Conscriptae ex libro Parisiis impresso anno 1727 In Sauaipolis vel Sauai*

issa Pour Regia Curia Magni Reguli Sauaiyassang omnium Regulorum indiae Siri Mah Raja Seu Primario in imperio Mogolensi a me pauperulo H. R. alias Joseph du BOIS anno 1732 die 10 Septembris Gentilium vero in quorum urbe habito 6 Mensis Koar anni 1789. It begins: Usus Tabularum Astronomicarum. De Epochis seu Radicibus Vulgaribus. Dies Astronomici quibus hisce Tabulis utimur ipso currentis diei et vulgaris meridie incipiunt.

#### Manuscript:

272. Khasmohor 7832. Five leaves and pp. 1–29, (30), 31–69, 80–176, (177–178), 179–200, (200b; crossed out), 201–226, (226b), 227, (227b), and 228–275 (text continuous). Pp. 158, 188, 209, and 227b are blank. 22 × 16 cm. 24/25 lines. Writing parallel to the shorter edge. Bound in leather.

P. 138. End of the canons: Laus Deo trino et uno et Beatissimae Virgini Matri Mariae et Omnium Sanctorum Universitati per infinita saeculorum Saecula amen.

*finitus fuit liber iste die 10 Septembris anni 1732 consecratumque fuit incolae S. Nicolai de Tolentino cui dies sacratus est in urbe nova a Gannis condita Sauaissapour Domini me(?), Magni regis Yassangh Sauai in imperio Mogolis omnium scientiarum Protectori dignissimo cuius vitam Deus praelongam et incolumnem sacro...* (italicized words are written over an early inscription in darker and larger letters).

P. 139. Tables begin. At bottom in larger hand: *diferentia gentilium Caleuli subtractiva 19 gradus 39 3.*

P. 141 in-margin in larger hand: *Sauayapur Differentia a Penatibus 4'40''.*

P. 142 at bottom in larger hand:

Deli ex bononia 4. 16. 0 Subtr. Sawayaepur 26 56  
Sauaissapur 4 11 Subtr. 24 30 0  
odapur Kenauchu 27 0

P. 146. Above Tabulae VII Ascensio recta is written: *jadwal* (in Persian script) *sāranī* (in Nāgarī) *Mātalee* (in Roman script) *matāli<sup>c</sup>* (in Persian script).

P. 150 Above Ascensio recta: *sva 5 sṛghatīḥ* (in Nāgarī). Above Declinatio: *krāti* (in Nāgarī). Beside Canis minor Procyon: *Lubdhac badhu*. Beside Geminor. Caput boreale: *Pritham punārvasu*. Beside Geminor. Caput australe: *Punārvasu*. Beside Leonis cor: *Magha*. Beside Leonis Lucida lumbar: *Purba phalguni*. Beside Leonis Cauda: *utra phalguni*. Beside Virginis Spica: *chitra*.

P. 151. Beside Librae lanx australis: *Bisagha*. Beside Sagitarii in arcu Aust: *Purbaghatt*. Beside Aquarii Humerus sequens: *sutibighai*.

P. 153. Beside Medii Motus Solis: *manayar Suray*. Beside Epochae anni Christ: *issa keage barsume*. Beside column of centuries: *issa kepisya*. Above Iul.: *rumi*. Beside gregoriani: *fringi*.

P. 154. Monthly mean motion: *meinalena*. Daily mean motion: *dinkelena*. Yearly mean motion: *barsunme bikre lena*.



Pp. 156 and 157. Subtrahe descendendo: catena nishe. Adde ascendendo: yorna upar.

P. 161. In table of yearly motion of Moon, every 4th year has an intercalated day; above table is written Kabisa.

P. 176. Inclination Orbitae Lunae: śarakona (in Nāgarī).

P. 177. Laghu con.

P. 206. Stella (symbol of Mercury): bu (in Nāgarī).

P. 227. Tabula LV. Accelaratio fixarum supra Motum Medium Solis.

Pp. 228–257. Sexagesimal multiplication table: 1 to 60 multiplied by each number from 2 to 60.

At the front of the volume are 6 folia here designated by the letters A to F.

F. Av. Computation of the longitude of the Sun on 4 March 1732 at 1;22,3 hours (found to be  $11^{\circ} 14;16,17^{\circ}$ ). The heading is: Locus Solis 4 Martii horae 48' 3" 1733.

F. B. Computation of the longitude of the Moon on 4 March 1732 at 6;48,3 hours (found to be  $3^{\circ} 11;12,14^{\circ}$ ) and a repetition of the computation of the longitude of the Sun precisely as on f. Av. The heading for the Moon is: quaeritur locus ☾ die 4 Martii hora 6 min 48' secund 3 anni 1732 bisext. A second scribe has added: Dehli. The heading for the Sun is: loc. ☉ 4 Martii 6 ho 48' 3" 1732 bisex.

F. Bv. de horoscopo primo cum Solis loco accipe ascensionem rectam Solis deinde abex ascensione superiore, et quatabis Summe differentia.

F. C. Title-page. The title is: TABULAE ASTRONOMICAE In quibus Solis Lunae reliquorum Planetarum Motus ex ipsis observationibus nulla adhibita Hypotesi traduntur habenturque praecipuarum Fixarum in nostro Horizonte Conspicuarum positiones. Iucundi Calculi Methodus Cum Geometrica ratione computandarum eclipsium sola triangulorum rectilineorum Analyti exponitur. Ad Meridianum Observatorii Regii Parisiensis in quo habitae sunt observationes ab ipso Autore PHILIPPO de la Hire Regio Matheseos Professore et Regio Scientiarum Academiae Socio.

F. Cv. Picture of the seal of Ioseph Dubois and an heraldic shield which was not filled in.

Sawaineopolis

Ff. D–Ev. Letter by Du Bois dated: Sawaiissapour die 10 septembris stilo novo annui Xrti D. 1732 Gentilium vero in quorum urbe habito 6 Mensis Koar anni 1789. Published by R. Mercier, *IJHS* 28, 1993, 157–166; recopied here as written:

[f. D] Lector benigne

Quo faeto nesio an fortuna impellente divinaque providentia disponente, post annos ferme 15 peregrinationum in diversis mundi Partibus, tandem in Vastissimo Indiae Orientalis Imperio quam Mogol dicitur perveni; uti postquam Majoris Consequentiae urbes peragravi in eius Metropoli cui nomen et Dehlii et Sciajanabad est appulli; et Cum Urbs ista Imperatorum Curia et totius Imperii Centrum sit, simul et peregrinatum refugium et extraneorum Concurrentium est assylus, Ibi ergo in Domu cuiusdam europei filii cui nomen Alexander Martin cuius Pater olim ex Gallia advenerat natus in Urbe Toulon in provincia



Provinciae. cuius nomen erat Iacob Martin Kan. (hoc est Princeps) iam defunctus. filii eius duo superstites, scilicet supra memoratus minor natus et Alius eo Major Ludovicus Martin nomine et ipsi a Imperatore pari honore et deliciis habiti sunt et post Mortem Patris Ludovicus Imperatore imperante Patris defuncti nomen acceperat scilicet Monsieur Martin Kan minor etiam eiusdem Praecepto franghi<sup>a</sup> Kan. Id[e] est Europeus Princeps. hoc est clare dicendo inter Principes eos numeravit Imperator Cum stipendiis honorabilibus necnon etiam Primarii Chirurgii Officio; igitur ergo apud dictum Alexandrum manens per aliquos menses inveni apud ipsum in eodem Loco seu prope manentem Europeum alium sabaudum Cui nomen Theodorus forestii et ipse Magnus. ingeniorans apud Imperatorem honoratissimo stypendio 200 rupiarum singulis mensibus; isti ergo duo Astronomiae non ignari quotidie in Matheseos problematibus quotidie tempus superfluum expendebant, ex quorum exercitio mihi cupiditas valde fuit etiam addiscere astronomiam quam antea<sup>b</sup> [f. Dv] Cum Astrologia eam confundentem abhorrebam. Sed Cum principium fundamentale istius Caelicae scientiae Arithmetica sit in primis in eam totis viribus discendam ingenium aplicavi. Alexander vero aut ex natura sua vel occupationum suorum Causa parum vel nihil doctrinae suppeditabat Theodorus vero libera et bona voluntate et Astronomiae et Euclidis Elementa Italico idiomate et Gallico subministravit. interea propter aliquas rationes oportuit mihi domicilium mutare et apud quemdam principem Minoris sphaerae Cui nomen Seid ferfarus Kam pro Medico eius servitium accepi Veni Cum stipendio valde moderato necessitati id postulante ubi ferme per annum sum Moratus. interim Deus ter optimus Maximus. per vias mihi ex toto<sup>c</sup> ignotas duxit in servitium Cuiusdam Maximi Reguli Gentilis cui nomen SAWAY YASSANG. qui Astronomorum Princeps, seut uti Alphonsus Castellae in aeternae dotem et astronomorum alimentis 400000 millia aureorum expendit ipse in eisdem stypendis singulis mensibus jam a sex annis 4000 rupiarum quae aequivalent Venetis aureis vel hollandicis vel Ungaris 1000. et in diebus augetur. ipse etiam in diversis Urbibus istius Imperii observatoria Magnifica Cum Machinis Maximis suo ingenio et si liceat dicere ferme suis Manibus fabricata, de qua re sum Ego, Deus est testis: OCularis<sup>d</sup> testis non semel nec bis, Machinae istae [f. E] sunt tam maximae Exempli gratia turris in trianguli anguli recti forma, cum linea aequinoctia in medio divisa usque ad minuta tertia et ad sensum divisibilis usque ad dena facta fuit ipse vero ex Cera molle suis manibus prototypum feci(t)<sup>e</sup> et artificibus tradidit omnes enim ab eo sunt edocti turris<sup>f</sup> vero erit alta 73 pedum romanorum et modo astrolabium 12 ulnarum seu 36 Pedum romanorum modo sphaerae planae sed et dum ista scribo et modo incipitur aliud 108 pedum ei simile et multa alia &c. Iste ergo Regulus inveniens almagestum P P. Riccioli vidit et antea Cognoverat multam differentiam esse in suis Tabulis gentilium unde Persicas sciayahan olim Totius Indiae Orientalis Imperatoris jussu<sup>g</sup> tabulas in indorum lingua<sup>h</sup> Converti feci(t)<sup>i</sup> Cum Expensis 100000 rupiarum in quibus etiam aliqua differentia ferme ad gradum usque invenit unde quidam Pater Societatis Iesu natione Lusitanus Rector Collegii Agrae in eodem Imperio, ab eo missus fuit Europae pro quaerendo astronomo perito qui Pater ivit et redivit secumque istas quas ego descripsi tabulas Cum aliis instrumentis Mathematicis attulit donarium a

Lusitanorum Rege<sup>j</sup> et quidam Puer ■ Patre educatus India Oriundus maximo ingenio Praeditus nomine Petrus da Silva etiam Lusitania apud R. et Claris<sup>m</sup> Patrem Ioannē Baptistā Carbone astronomiae operam dedit, ad regulum venit Regulus valde laetus Tabulas suis Characteribus transcribi Iussit et omnes suos astronomos Calcula per eas facere Iussit [f. Ev] Modo vero exoptat ut aliquis Parisios vel Londinum Pergat et ex fonte Astronomiam hauriat. Unde ergo. O peritissimi Caeli inspectores et Phaenomenon eius observatores vidite quo modo Usque inter Barbaros (si sic liceat vocare Pandectas istos) et nomen et hospitium doctrina vestra habeat Unde Credo Certe non dissonare veritatis si Clarissimae et Amplissimae Academiae scientiarum Parisiensi Cum Poeta possimus dicere.

Semper honos nomenque tuum laudesque Manebunt Non pigeat ergo o mi lector non pigeat inquam in fragili<sup>h</sup> ~~Charta~~ Charta studiis tuis Aeternum et<sup>i</sup> tibi Comparare nomen; et ab occidente in ultimis orientis partibus sicut D. f. lahirra sectatores et laudatores habere. Roga ergo syderum Mundique totius Conditorem Cuius armoniae est Contemplator ut ipse Caelorum Civem et te et me facere Dignetur Vale

Sawaineopolis

Sawai issapour die 10 septembris stilo novo annui Xpti D. 1732 Gentilium vero in quorum urbe habito 6 Mensis Koar anni 1789.

Tuus dum vivam  
J. du Bois.

a. frankihi corr. to franghi. b. antea below line. c. valde crossed out, ex toto written above. d. testis at end of line, OCu written over this, laris at beginning of next line. e. feci. f. murris, t written over m. g. jussu above line. h. lingua. i. feci. j. Regae. k. fragi at end of line, gili at beginning of next line. l. et above line.

Ff. F-Fv. Index eorum<sup>a</sup> Praeceptorum in hoc libro Contentorū.

a. earum.

Pp. 258-263. Calculus Eclipsis ☾ Celebrati die 8 Iunii anni 1732 in urbe Dehli metropolis Indostani.

P. 262: Dies Civilis incipit in Medinoctio. et sic a media nocte usque ad meridiem sunt 12 horae. subtrahe eas et habebis 7 ergo eclipsis ista contigit die 8 Iunii 7 horis et 40' 5" post meridiem dico mediam eclipsen

---

semidiametrum umbrae terrae	42-21
Latitudo lunae australis descendentis	11-0
semidiametrum lunae	15-35
motus horarius lunae ad solem	30-38

P. 263. Tipus Eclipsis lunae Celebrati die 8 Iunii 1732.

Diagram of the eclipse showing the shadow of the earth and the position of



the Moon at 6, 7, 8, 9, and 10 P.M.

Incepit hora 5 et 49 minuta subtus terram et 6 54 minutis

dimidium seu medium eclipsis 7 horis 42 minuta

incipiet emergere ab umbra terrae 8 horis 28 minutis

finis 9 horis 33 minutis.

totalis duratio 3 horarum 44 minuta.

P. 264. An example of multiplication by the door-jamb method, first in Arabic-Persian numerals, then in European numerals.

P. 265. Another copy of the previous example of multiplication in European numerals. At the top of the page is written: *Multiplicatio logistica Persarum et Mogolium*.

Below the example, in crude letters, is written: *kisna discipulus magistro suo se commendat die 11 octobris 1734*.

Below this another scribe has written: *febr. 29 1686 media nox*.

P. 266. Fragment of a computation of a mean longitude; above it is written *februarius*. At the end is written in Nāgarī: *mādadīla*.

P. 267. At the top the times of the beginning and end of an eclipse:

in 3 48 26

fin 6 59 16

Below this is an incomplete horoscopic diagram, below which are two inscriptions by different hands in Nāgarī; the top one, which alone is legible, is *ārāja*.

Pp. 268–271. A description in Spanish of how to compute the longitude of the Sun; written by a new scribe.

P. 268 begins: *quero locum solis anni 1715 dies 20 Martii hora 5 = 32'. 25" matutinis tempus medium Valencia*.

*el sobre dicho tiempo se convierte primero en astronomico tomando sus tiempos parciales comples y que da en esta forma: 1714 años febrero Completo; 18 dias 17 horas 32 min 25 seg.*

*para la segunda Correction se va a la Tabla 4 y se halla que la diferencia de los Meridianos de Valencia y <sup>madrid</sup> paris o de las tablas es 14 40 seg Con la nota s. que significa ser. substrativa.*

P. 271 ends: *y se proseguira la misma operacion hasta hallar como antes la prostapheresi como en el exēplo siguiente que es el mismo que antes solo que se supone ser el tiempo dado verdadero aparente.*

P. 272. A computation of the longitude of the Moon for 16 November 1651 at 9:36; written by a different scribe. At the bottom is written: *M S maria de Rosario*

*ora.*

Pp. 273–274. Blank.

P. 275 *adustus felis gelidas timet aquas.*

A Sanskrit prose version of de La Hire's *Tabulae Astronomicae* produced by Jayasimha's paṇḍitas between 1732 and 1734. Du Bois referred on 10 September 1732 on f. E of manuscript 272 to: *regulus valde laetus tabulas suis caracteribus*



transcribi iussit; this is probably Kevalarāma's *Dr̥kpaṣasārīṇī* rather than the Sanskrit prose version. See D. Pingree, *PAPS* 143, 1999, 81.

The Sanskrit prose version begins: *atha ravyādigrahāṇāṃ madhyamakriyā spaṣṭakriyā ca sodākaṇā likhyate || tatrāḍau abdapaśuddhyor ānayanena ahaṛ-gaṇānayanam.*

The *Phiraṅgicandracchedyopayogika* discussing nine geometrical figures illustrating astronomical models. This was probably drawn up after the arrival in Jayapura of Fathers Boudier and Pons in August 1734. See D. Pingree, *PAPS* 143, 1999, 81–85.

The *Phiraṅgicandracchedyopayogika* begins: *tatra asarekhāṃ vyāsaṃ kṛtvā ekaṃ vṛttaṃ kāryaṃ tadupari ekaṃ sūcīkṣetraṃ kāryaṃ.*

#### Manuscripts:

273. Khasmohor 5292. 2 fly leaves, ff. 1–52, and 1 fly leaf. 31.5 × 22.5 cm. 23–25 lines. Writing parallel to the shorter edge. Bound in cardboard boards covered with red and white striped cloth.

Recto of first front flyleaf. A diagram of a cone intersected by a plane to create an ellipse. This is the first diagram of the *Phiraṅgicandracchedyopayogika*.

Ff. 1–39v. The Sanskrit prose version.

F. 39v. Tables XXXIII and XXXIV of the *Tabulae Astronomicae*; and the first diagram of the *Phiraṅgicandracchedyopayogika*.

Ff. 40–52v. The *Phiraṅgicandracchedyopayogika*.

F. 52v ends: *iti ravigrahaṇasya gaṇite iti karttavyatā || || atrodāharaṇaṃ || ||*

274. Khasmohor 5609. Ff. 33–48. 32.5 × 23 cm. 27–29 lines. Each double folium is a single sheet folded to the left. Incomplete.

F. 33 contains Table XXXVII of the *Tabulae Astronomicae*, which is found on f. 33 of manuscript 273 also.

F. 39v contains Tables XXXIII and XXXIV of the *Tabulae Astronomicae*, which are found on f. 39v of manuscript 273 also.

Ff. 40–48. The *Phiraṅgicandracchedyopayogika* without any of the diagrams.

F. 48 ends: *iti ravigrahaṇasya gaṇite iti karttavyatā || || atrodāharaṇaṃ ||*

Attempts to illustrate in diagrammatic form de La Hire's third lunar equation, which is successfully depicted in figure 8 of the *Phiraṅgicandracchedyopayogika*.

#### Manuscript:

275. Khasmohor 5182. 3 sheets. A 66 × 47.5 cm; B 63.5 × 46.5 cm; and C 65 × 47 cm.

Sheets A, B, and C contain diagrams showing the earth in an orbit about the Sun; the mean and true orbits of the Moon are shown about both the earth and the Sun; and the apsidal line of the Sun is depicted. For an illustration of part of one of these see D. Pingree, *PAPS* 143, 1999, p. 83.

Sheet A also has two diagrams showing a second and a fourth situation when the equation is at its maximum.

Records of positive and negative differences in the positions of the Moon computed by means of de La Hire's tables and, presumably, observations for each of the twelve months in the Śaka years from 1784 to 1795 (AD. 1727/8 to 1738/9); similar records for differences between computations with the "New Tables", which may refer to the *Zīj i Jadīd* of Ulugh Beg. The entries seem to be in minutes of arc; see D. Pingree, *PAPS* 143, 1999, pp. 80–81.

**Manuscript:**

276. Khasmohor 5183(a). 12 ff. 55 × 43 cm. 31 lines (top for month name and year; rest for each of the 30 days in the month). Only the obverse of each folium is written upon.

F. 1 at top: *laiyarasya vedhāḥ*

5183(b). 12 ff. 58.5 × 38 cm. 31 lines set up as in 5183(a).

F. 1 at top: *navīnasāraṇivedhāḥ*.

## INDICES

### Concordance of library numbers and catalogue numbers

#### Khasmohor

157(a)	70	5079	159	5182	275	5301	42	5495(b)	177
570	248	5081	132	5183	276	5302	11	5496	115
1086	81	5082(a)	227	5187	14	5303	43	5504(a)	181
1257	221	5082(b)	195	5188	20	5305	54	5504(b)	197
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2954	226	5082(e)	133	5190	15	5319	75	5504(d)	103
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4876	216	5083	154	5197	118	5349(b)	155	5517	121
4877	219	5086	82	5198	71	5349(c)	162	5518	122
4878	220	5122(a)	83	5200	108	5349(d)	192	5519	124
4951	72	5122(b)	89	5203	56	5352	111	5520	187
4953	47	5125	128	5205	25	5353(a)	104	5530	85
4954	238	5129	210	5206(a)	237	5353(b)	183	5535	86
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4958	229	5142	12	5245	32	5356	57	5570	127
4960	266	5144	61	5246	218	5358	50	5572	51
4961	268	5145	13	5247	129	5360	6	5573	16
4962	269	5174(a)	206	5249(a)	109	5362	88	5574	180
4973	231	5174(b)	160	5249(b)	125	5378	119	5576	66
4974	230	5174(c)	179	5250	175	5390	33	5580	64
4975	233	5174(d)	200	5251	178	5391	30	5583	58
5011	76	5174(f)	207	5253(a)	98	5392	28	5588	143
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5014	157	5174(h)	113	5254(a)	137	5403	8	5591	41
5015(a)	130	5174(i)	184	5254(b)	174	5406	63	5592	21
5015(b)	163	5174(j)	97	5254(c)	201	5408	49	5593	24
5015(c)	131	5174(k)	96	5254(d)	191	5420	156	5594	126
5016	87	5174(l)	161	5254(e)	138	5424(a)	99	5595	112
5026	247	5174(m)	160	5254(f)	198	5424(b)	101	5596	165
5030	29	5174(n)	173	5254(g)	110	5427	59	5597	105
5032	249	5174(o)	208	5254(h)	169	5429	67	5598	106
5049(a)	166	5174(p)	134	5254(i)	139	5439	31	5600	78
5049(b)	147	5174(q)	196	5254(j)	99	5446	95	5601	73
5050	158	5174(r)	190	5255	69	5469	232	5602	151
5051	141	5174(s)	160	5257	37	5479	205	5607	150
5052	100	5174(t)	135	5283	84	5480	203	5609	274
5055	68	5174(u)	182	5284	91	5481	202	7832	272
5056	107	5174(w)	186	5292	273	5483	255		
5057	55	5175(a)	136	5294	146	5484	262		
5059(a)	149	5175(b)	62	5295	244	5488	23		
5059(b)	148	5176(a)	140	5299	116	5489	22		
5060	168	5178	217	5300	211	5495(a)	176		



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23	267	1	18	34	93	261	2
24	265	2	7	35	90	262	1
31	270	3	39	36	152		
33	260	4	36	37	74		
42	257	5	45	38	94		
43	3	6	34	39	65		
44	253	7	212	40	60		
45	261	9	234	41	153		
46	259	10	240	42	164		
47	38	11	236	43(a)	193		
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23	5	17	80	44(e)	194		
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		26	225	48	171		
		27	209	49	142		
		28	256	50	228		
		29	117	51	246		
		31	123	269	79		
		32	243	272	215		
		33	48				

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10 May 1572	55	3 June 1706	25	10 Feb. 1756	58
16 Nov. 1579	6	31 Aug. 1706	21	13 Feb. 1756	106
5 Mar. 1596	229	5 Sept. 1706	76	1 Sept. 1756	89
1596/7	144	17 Sept. 1706	244	15 Feb.-20 June 1757	155
		23 Sept. 1706	232	29 Sept. 1757	125
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11 Jan. 1617	230	9 Nov. 1706	9	21 Aug. 1769	59
2 Nov. 1617	231	14 Nov. 1706	238	30 Aug. 1769	176
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30 Aug. 1632	209	1 Mar. 1707	11	1771/2	250
1 Nov. 1642	7	8 Sept. 1709	26	31 Oct. 1788	60
27 Jan. 1647	72	2 Apr. 1710	88	14 Nov.-12 Dec. 1788	189
21 Sept. 1651	23	30 Mar. 1711	57	28 Nov. 1788	258
22 Jan. 1652	22	27 Mar. 1716	181	14 Dec. 1788	234
22 Sept. 1653	73	18 Oct. 1723	39	1788/9	89
7 Dec. 1656	149	6 Apr. 1727	267	1791/2	53
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6 Mar. 1679	38	23 Oct. 1729	253	9 Oct. 1797	1
10 Oct. 1690	36	15 Nov. 1730	123		
28 Oct. 1699	50	4 July 1731	20	16 Jan. 1826	79
		10 Sept. 1732	272	11 Mar. 1826	80
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### Scribes and Owners

Rddhinātha Vyāsa copied 164 on 5 May–6 August 1703.

Rṣaladasa (also Rṣalalāla) Yati, pupil of Lakṣmīcandra Vācaka, copied 155 at Jayapura between ca. 15 February and 20 June 1757.

Rṣi Kaṭājī, pupil of Rṣi Gamvajī(?) and teacher of Rṣi Thaṣa(?), who copied 149 at Medanīpurī in 1656.

Kaḍva Dīkṣita, relative of Jayakṛṣṇa Dīkṣita, who owned 25.

Kamalākara Bhaṭṭa, son of Padmākara Bhaṭṭa of the Jāmadagnigotra and father of Lakṣmaṇa Bhaṭṭa, who copied 23 in 1651 and 22 in 1652.

Kāśī Dīkṣita, relative of Jayakṛṣṇa Dīkṣita, who owned 25.

Kīrttiratna Sūri, teacher of teacher of teacher of Paṇḍita Dūlicandra, who copied 78 at Mulatāna in 1741.

Kṛpārāma copied 257 in ca. 1729; 259; and perhaps 255.

Kṛṣṇa copied 229 on 5 March 1596.

Keśava, father of the scribe who copied 47 in 1626/7.

Gaṅgārāma of Kāśmīra copied 267 for Jayasiṃha on 6 April 1727.

Gamvajī(?), teacher of teacher of Rṣi Thaṣa(?), who copied 149 at Medanīpurī in 1656.

Gulābrāya, father of Tejabhāna, who copied between 1755 and 1769.

Gokula (also Gokulanātha) Joṣī, son of Śambhūnātha Puṇḍarīka Joṣī, copied 189 between 14 November and 12 December 1788; 171 on 3 April 1793; 172 on 28 April 1793; 93 for himself; and had 152 copied by Gopinātha.

Gopinātha, son of Rāmeśvara Vyāsa, copied 60 on 31 October 1788; 234 for Jāgeśvarajīka on 14 December 1788; 236 on 5 November 1789; and 152 for Gokulanātha.

Govardhana, son of Śrīnātha of the Nāgarajñāti, copied 146 for Dāmodara Miśra at Jirṇadurga in 1604/5.

Govinda Kāka owned 117.

Govinda Daivajña had 27 copied by Dayārāma in 1727.

Chotelāla copied 220.

Mahopādhyāya Jagaccandra, pupil of Vācaka Hīracandra, pupil of Bhaṭṭāraka Jayacandra Sūri of the Pārśvacandrasūrigaccha, and teacher of Lakṣmīcandra Muni, for whom Harṣāsahita Rṣi copied 88 at Yovanera in 1710.

Jagannātha Joṣī bought 269.

Jagannātha Samrāt owned 36, 39, 123.

Jayakṛṣṇa Dīkṣita, son of Śrīkṛṣṇa Dīkṣita, owned 25.

Bhaṭṭāraka Jayacandra Sūri of the Pārśvacandrasūrigaccha, teacher of teacher of teacher of Lakṣmīcandra Muni, for whom Harṣāsahita Rṣi copied 88 at Yovanera in 1710.

Mahārājādhirāja Jayasiṃha had Tulārāma copy 41, 52, 76, 87, 118, 232, 233, 238, and 244 in 1706; 11 in 1707; and 26 in 1709; had Nātha copy 9, 10, and 21 in 1706; and had Gaṅgārāma copy 267 in 1727.

Jāgeśvarajīka had Gopinātha copy 234 in 1788.

Jiva Dīkṣita, relative of Jayakṛṣṇa Dīkṣita, who owned 25.

Jīvarāja Dīkṣita, relative of Jayakṛṣṇa Dīkṣita, who owned 25.

Paṇḍita Joga, father of Harinārāyaṇa Praśnorā, who copied 28 and 77 in 1733.

Joseph du Bois copied 272 in 1732.

Ṭikārāma copied 265 in 1728/9.

Paṇḍita Dūlicandra, pupil of Paṇḍita Sadāsukha Gaṇi, pupil of Darśanasundara Gaṇi, pupil of Kīrttiratna Sūri, copied 78 at Mulatāna on 21 March 1741.



Tulārāma copied for Jayasimha: 76 on 5 September 1706; 244 on 17 September 1706; 232 on 23 September 1706; 87 on 11 and 26 October 1706; 41 on 5 November 1706; 238 on 14 November 1706; 233 on 16 November 1706; 52 at Amadāvāda on 8 December 1706; 118 on 8 December 1706; 11 on 1 March 1707; and 26 on 8 September 1709.

Tejabhāna (also Tejabhānu and Tejobhānu), son of Gulābrāya, copied 105 on 30 January 1755; 58 for himself on ca. 10 February 1756; 106 on 13 February 1756; 125 on 29 September 1757; 99 in April/May 1769; 175 on 11 May 1769; and 98 probably at Mulatāna on 16 May 1769.

Ṛṣi Thaṣa(?), pupil of Ṛṣi Kaṭājī, pupil of Ṛṣi Gamvajī(?), copied 149 at Medanīpurī on 7 December 1656.

Dayārāma copied 27 for Govinda Daivajña on 28 May 1727.

Darśanasundara Gaṇi, pupil of Kīrttiratna Gaṇi and teacher of teacher of Paṇḍita Dūlīcandra, who copied 78 at Mulatāna on 21 March 1741.

Dāmodara Miśra had Govardhana copy 146 at Jirṇadurga in 1604/5.

Devarṣi Jyotiṣi copied 144 for Lakṣmīcandra at Sāgānayari in 1506/7.

Dhanarāja, son of Vidyāvinoda Mathena, copied 51 for himself on 17 May 1701.

Dhaneśvara Paṇḍarīka had Śyāmasundara copy 80 on 6 March 1826; and owned 225 and 228.

Nātha Bhaṭṭa, son of Viṭṭhala Bhaṭṭa of the Medapāṭhajñāti, a resident of Rūpapura in Gujarāta, copied for Jayasimha: 21 on 31 August 1706; 9 on 9 November 1706; and 10 on 30 November 1706.

Padmākara Bhaṭṭa of the Jāmadagnigotra, grandfather of Lakṣmaṇa Bhaṭṭa, who copied 23 in 1651 and 22 in 1652.

Pāṇḍai(?) copied 55 on 10 May 1572.

Pīthīnātha owned 266 in 1717.

Puruṣottama Vyāsa of the Śrīmālījñāti, grandfather of Śrīdatta, who copied 230 at Jodhapura on 11 January 1617; 231 at Śuddhadantī on 2 November 1617; and 46 for himself at Jodhapura on 25 June 1618.

Premarṣi copied 104 at Medanarapura in 1674/5.

Mahopādhyāya Mativilāsa of the Maladhāragaccha, teacher of teacher of Sahajasundara, who copied 6 at Argalapura in 1579.

Manasārāma owned 266 in 1696.

Mitrarāma Bhaṭṭa copied 117.

Rāmadatta Rāma copied 53 in 1791/2.

Rāmabhaṭṭa copied 1, probably at Kāśī, on 9 October 1797.

Rāmeśvara Puṇḍarīka, father of Viśveśvara, who owned 36, 39, 48, 60, 65, 90, 123, 212, 236, 240, 258.

Rāmeśvara Vyāsa, father of Gopīnātha, who copied 60 in 1788; 234 for Jāgeśvarajika in 1788; 236 on 1789; and 152 for Gokulanātha.

Lakṣmaṇa Josyā owned 22.

Lakṣmaṇa Bhaṭṭa, son of Kamalākara Bhaṭṭa, son of Padmākara Bhaṭṭa of the Jāmadagnigotra, copied 23 on 21 September 1651 and 22 on 22 January 1652.

Lakṣmīcandra had Devarṣi Jyotiṣi copy 144 at Sāgānayari in 1506/7.

Lakṣmīcandra Muni, pupil of Mahopādhyāya Jagaccandra, pupil of Vācaka Hīracandra, pupil of Bhaṭṭāraka Jayacandra Sūri of the Pārśvacandrasūrigaccha, had Harṣāsahita Ṛṣi copy 88 at Yovanera in 1710.

Lakṣmīcandra Vācaka, teacher of Ṛṣaladāsa Yati, who copied 155 at Jayapura in 1757.

(Lakṣmīdhara Lekhaka) copied 253 on 23 October 1729; and probably copied 260.

- Lichaminārāyaṇa copied 5 on 10 July 1895; 35 on 24 August 1895; 4; and 17.  
 Līlādhara copied 56 at Avantikā on 18 August 1705.  
 Vallabha Bhaṭṭa copied 8 at Avantipurī on 3 July 1705.  
 Vāsudeva copied 72 for his son at Kāśī on 27 January 1647.  
 Viṭṭhala Dīkṣita copied the original of 76 in 1625.  
 Viṭṭhala Bhaṭṭa of the Medapāṭhajñāti, a resident of Rūpapura in Gujarāta, father of Nātha Bhaṭṭa who copied for Jayasimha; 9, 10, and 21 in 1706.  
 Vidyāvinoda Mathena, father of Dhanarāja, who copied 51 in 1701.  
 Vaijanātha Jośi owned 74.  
 Śaṅkara (also Śaṅkaradāsa) Vyāsa, son of Puruṣottama Vyāsa of the Śrīmālījñāti, father of Śrīdatta who copied 230 at Jodhapura in 1617; 231 at Śuddhadantī in 1617; and 46 at Jodhapura in 1618.  
 Sambhunātha Puṇḍarīka Jośi, father of Gokulanātha Jośi, who copied 189 in 1788; 171 and 172 in 1793; and 93; and had 152 copied by Gopīnātha.  
 Śiva Daivajña owned 84.  
 Śyāmasundara copied 80 for Dhaneśvara Paṇḍarīka on 6 March 1826.  
 Śrīkṛṣṇa Dīkṣita, father of Jayakṛṣṇa Dīkṣita, who owned 25.  
 Śrīdatta, son of Śaṅkara Vyāsa, son of Puruṣottama Vyāsa of the Śrīmālījñāti, a resident of Śubhaṭapura, copied 230 at Jodhapura on 11 January 1617 during reign of Sūryasimha; 231 at Śuddhadantī on 2 November 1617; and 46 at Jodhapura on 25 June 1618.  
 Śrīdatta Jyotirvit, father of Satīdāsa, who owned 24 in 1657.  
 Śrīnātha of the Nāgarajñāti, father of Govardhana, who copied 146 for Dāmodhara Miśra at Jirṇadurga in 1604/5.  
 Śrīnātha copied 209 on 30 August 1632.  
 Śrīvatsa Dīkṣita, relative of Jayakṛṣṇa Dīkṣita, who owned 25.  
 Satīdāsa, son of Śrīdatta Jyotirvit, owned 24 on 12 January 1657.  
 Paṇḍita Sadāsukha Gaṇi, pupil of Darśanasundara Gaṇi, pupil of Kīrttiratna Gaṇi, and teacher of Paṇḍita Dūlicandra, who copied 78 at Mulatāna on 21 March 1741.  
 Santoṣarāma copied 75 on 5 July 1705.  
 Saravaṇa Gaṇi, pupil of Mahopādhyāya Mativilāsa of the Maladhāragaccha and teacher of Sahajasundara, who copied 6 at Argalapura in 1579.  
 Sahajasundara, pupil of Saravaṇa Gaṇi, pupil of Mahopādhyāya Mativilāsa of the Maladhāragaccha, copied 6 for himself at Argalapura on 16 November 1579.  
 Sūrjabhāṇa copied 176 on 30 August 1769 and 178 on 1 September 1769.  
 Sūryabhānu owned 67.  
 Senāpati owned 73.  
 Harikṛṣṇa copied 73 on 22 September 1653.  
 Harinārāyaṇa Praśnorā, son of Paṇḍita Joga, copied 77 on 22 June 1733 and 28, probably at Kāśī, on 19 August 1733.  
 Harṣāsahita Ṛṣi copied 88 for Lakṣmīcandra Muni, pupil of Mahopādhyāya Jagacandra, pupil of Vācaka Hīracandra, pupil of Bhaṭṭāraka Jayacandra Sūri of the Pārśvacandrasūrigaccha, at Yovanera on 2 April 1710.  
 Vācaka Hīracandra, pupil of Bhaṭṭāraka Jayacandra Sūri of the Pārśvacandrasūrigaccha, teacher of teacher of Lakṣmīcandra Muni, who had Harṣāsahita Ṛṣi copy 88 at Yovanera in 1710.

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Agra  
 Bononia  
 Dehli, Deli  
 Gallia  
 Gallicus  
 Hollandicus  
 India  
 Indostanus  
 Indus  
 Italicus  
 Kenauchu (Kannauj?)  
 Londinum  
 Lusitania  
 Lusitanus  
 Madrid  
 Mogol, Mogoles  
 Odapur (Udaipur)  
 Paris  
 Parisiensis  
 Parisii  
 Persae  
 Persicus  
 Portugal  
 Provincia  
 Romanus  
 Sauai issa Pour, Sauaissapur (Savāi Īśapura)  
 Sauaipolis  
 Sauayapur  
 Sawai neopolis  
 Sawayaepur  
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 Toulon  
 Ungarus  
 Valencia  
 Venetus

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# A DESCRIPTIVE CATALOGUE

of the Sanskrit Astronomical Manuscripts

Preserved at the Maharaja Man Singh II Museum  
in Jaipur, India

**T**his catalogue of the astronomical manuscripts preserved at the Maharaja Man Singh II Museum in Jaipur, India, provides a substantial part of the foundation for an extensive and penetrating analysis of the astronomical activities of Sawai Jayasimha Maharaja from 1700 to 1743. Jayasimha collected Sanskrit manuscripts of traditional Indian astronomy, acquired Arabic and Persian manuscripts representative of the Muslim interpretation of Ptolemaic astronomy, built five observatories at which he employed both Hindu and Muslim observers, and produced a set of astronomical tables in Persian based on the Latin tables of Philippe de La Hire.

Descriptions of 275 astronomical manuscripts still housed in the palace library at Jaipur help clarify how Jayasimha was led to rely on observations for practical astronomy, and on European theories for accurate calculations of celestial phenomena.

Cover illustration: Sawai Jayasimha, Maharaja Man Singh II



### About the Author



David Pingree is University Professor and Professor of the History of Mathematics and of Classics at Brown University in Providence, Rhode Island.

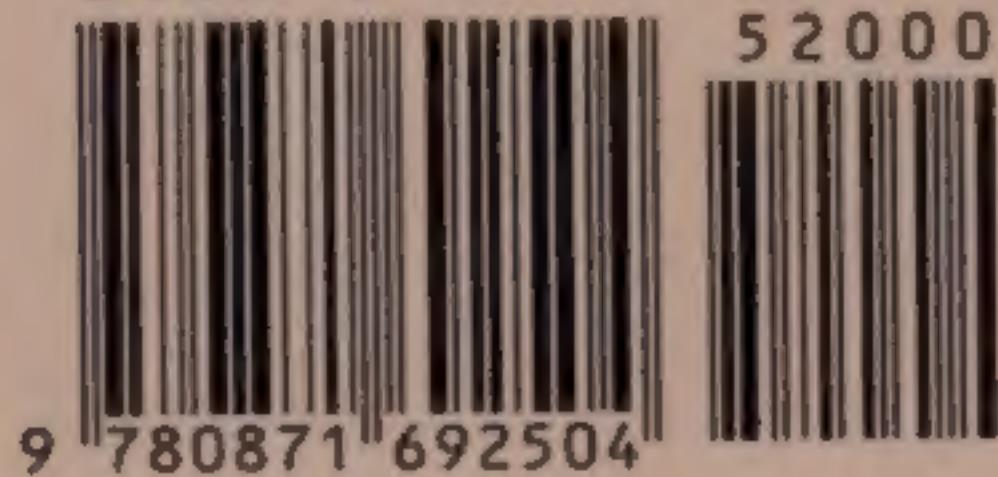
Dr. Pingree is founder and chair of the American Committee for South Asian Manuscripts and is a member of the American Philosophical Society. He was elected to the Society in 1975. Publications include *Sanskrit Astronomical Tables in the United States*, *Census of the Exact Sciences in Sanskrit* (five volumes, published by American Philosophical Society between 1970 and 1994), *Catalogue of the Chandra Shum Shere Collection in the Bodleian Library (Jyotibsastra)*, *Sanskrit Astronomical Tables in England*, *Catalogue of the Sanskrit Manuscript at Columbia University*, and *Catalogue of the Jyotisa Manuscripts at the Wellcome Library*.

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